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No. 155

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I. GENERAL INFORMATION

METHODS OF HALTING NORTH CHINA DESERTIFICATION OUTLINED

Beijing GUANGMING RIBAO in Chinese 15 Jun 81 p 1

[Article by Wen Zixiang [0491 1311 4382] and Liu Zhongqing [0491 0022 1987]: "Survey and Zoning of China's Desertified Area Resources Produces Heartening Results; Preliminary Determination of Desertified Land Area, Contributing Reasons, and Proposals for Corresponding Preventive Methods and Measures"]

[Text] Resources survey and zoning work conducted principally by the Lanzhou Desert Institute of the Chinese Academy of Sciences has brought heartening results. A prelimination determination has now been made of the country's northern desertified land area and contributing causes, and corresponding preventive methods and measures proposed.

Results of this survey show the area of China's northern desertified land to total 170,000 square kilometers, of which the area desertified during the recent half century is about 50,000 square kilometers. An additional 160,000 square kilometers is in potential danger of desertification for an area totaling 330,000 square kilometers. This area touches on 12 provinces, 207 autonomous regions (or banners) and municipalities, and 35 million people in northwest, north, and northeast China. The main reason for expansion in desertified land is irrational human economic activities. Eighty-five percent of the 50,000 square kilometer increase in desertified land during the past half centry has resulted from indiscriminate opening of farmland, over-grazing, and gathering of firewood. The remaining 15 percent has been caused by improper use of water resources, construction of industrial, mining, and transportation cities and towns, and the invasion of sand dunes.

Results of studies conducted by desert experts also show that the desert area of north China is continuing to expand, and that action must be taken with all possible speed to prevent and control it. For this purpose, they have used desertification of natural strips to develop criteria of overall characteristics and different rates of development of the desertification process, dividing the northern part of the country into 26 small areas within three large areas, and proposing relevant means and measures for the prevention and control of desertification. The experts believe that the most fundamental way to prevent and control desertification is rational use of local natural resources. They recommend measures such as readjustment of the direction of soil use in semi-arid grassland areas and desert grassland areas that have become desertified, restriction on the limits of dryland crop farming, the closing of desertified abandoned farmland and degenerated grasslands, and protection of existing plant cover. For moving sand dunes, forest strips may be planted between dunes, and sand stabilizing plants may be grown atop the dunes as related measures to stabilize the sand. An interconnected farmland ecological system for existing farmland consisting of shelter forest networks, strip forests, andmanmade grass feed bases should be built. Pressure of livestock on the grasslands in pastoral areas should be reduced, and manmade grasslands built, with rotated pasturing from one zone to another. For desertified lands adjoining the edges of deserts, in addition to protecting existing ground cover, oases are needed as a center within which field-protecting forest belts consisting of narrow small forest networks can be built. Around the oases, forest belts for protection against the sand and consisting of bushes can be put in place. On the outer edges of the oases, sand holding grasses may be planted thereby forming a complete shelter system.

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ECONOMIC TRIBUNALS ENFORCE SYSTEM OF RESPONSIBILITY CONTRACT TERMS

Beijing RENMIN RIBAO in Chinese 20 Jun 81 p 1

[Article by Xinhuashe Correspondents Liu Erning [0491 1422 1380] and Jiang Maosheng [5637 0602 3932]: "Changan County People's Court Sets Up Economic Tribunal To Assure Honoring of Contracts Under System of Responsibility for Production"]

[Text] Recently Changan County in Shaanxi Province broadcast the following announcement to the more than 700,000 peasants in the county: The County People's Court has established an economic tribunal, which will immediately begin hearing cases from rural villages involving all kinds of economic disputes.

The broadcast said that the tribunal resolutely supported implementation and honoring of contracts in various forms of a system of responsibility for production, and would assure the legal and proper rights and interests of the collective and individuals.

Reportedly more than [illegible],900 production teams in Changan County last year set up systems of responsibility for production, making either teams or individual workers responsible for production, and in a substantial number of cases contracts were signed. However, in actuality, the practice has been consolidated in only somewhat more than 1000 production teams, and honoring of rewards and penalties has been done in only 523 production teams. Many peasants have said with dissatisfaction that they are set up at the beginning of the year only to be disbanded in mid-year, and finally everyone continues to eat out of a "large common pot."

Changan County has spread the Xiliu Commune experience in distribution at year's end of issuing rewards first and meting out pentlties afterward. In addition, all the communes in the county have convened a meeting of commune member delegates to study ways to handle, on a case by case basis, specific problems in the implementation of systems of responsibility, and to carry out democratic appraisal of the contents of contracts. County CCP committees and communes have used these mass appraisals to formulate concrete programs for implementing systems of responsibility, which have been printed and issued to production teams to consult and carry out. All production brigades have convened meetings of commune member delegates to solemnly sign contracts so that everyone will be fully aware that the signing of contracts carries the force of law. How overfulfillment of production is to be rewarded, how drops in production responsibilities are to be penalized, and how to figure reductions necessitated by natural disasters must all be stipulated in detail. Contracts are signed jointly by production teams and those contracting, and brigades and commune member representatives are responsible for overseeing them. The

Economic Tribunal of the County People's Court explicitly announced that sabotage of implementation of systems of responsibility or failure to honor them will entail responsibility before the law.

These measures in Changan County have effectively erradicated the mental reservations of the masses and have promoted development of the system of responsibility for production throughout the county. As of end April, more than 70 percent of the production teams in the county had instituted uniform operation of various forms of a system of responsibility for production, principally those making individual laborers accountable for production quotas.

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HOT DRY WINDS IN NATION'S WHEAT BELT EXAMINED

Beijing DILI ZHISHI [GEOGRAPHICAL KNOWLEDGE] in Chinese No 5, May 81 pp 5-6, 4

[Article by Zhang Yangcai [1728 7402 2088]: "China's Hot, Dry Winds"]

[Text] Hot dry winds are largely a meteorological disaster for agriculture during the late season of wheat growth in the northern part of China; effects of hot, dry winds in southern parts of China and on crops other than wheat are rather minimal. Frequently, several hot, dry wind attacks during the process of wheat production can cause a serious decrease in wheat output. For example, 5 consecutive days of hot, dry winds in Huaiyang Prefecture during 1958, when the wheat happened to be in the milk ripe stage, reduced output by from 30 to 50 percent. In the central region of Shaanxi Province during 1964, damage done by hot, dry winds reduced output by an average 35 percent. Therefore, figuring out the damage done by hot, dry winds, the climatic laws governing their occurrence, as well as study of how to lessen the damage they do to crops is a major problem in grain production urgently in need of solution for China's wheat growing area.

Causes of Hot, Dry Winds and Damage They Do to Crops

Hot, dry winds are a form of agriculturally disastrous weather made up of high temperatures, low humidity, and accompanied by a certain wind force. Because the function of each of the meteorological elements that causes damage differs, separate places term these winds hot, dry winds, dry winds, hot winds, arid winds, or dry hot winds. For example, since most of the damage caused to spring wheat by hot, dry winds in the Yinchuan irrigation area of Ningxia Province is attributed to "heat," their aridity is secondary. In Jining Prefecture in Shandong and in the Xu-Huai area between late May and early June, a southwest wind blows for several days, as a result of which the wheat is scorched to death or a lot of empty husks result. The masses call this the "southwest fire wind," and say that when the "wheat gets to the grain in ear stage [around 6 June], it does not ripen but dies of itself." The hot, dry winds in the corridor at the western part of the Yellow River, however, frequently blow from the east, and the masses say, "the east winds of summer are very, very warm." From this it may be seen that despite different ways of referring to the hot, dry winds, in fact, high temperatures and low humidity cause physiological dessication of the crops, and the winds intensify the extent of damage caused by aridity

The occurrence in China of dry, hot winds is intimately related to changes in atmospheric circulation in Southeast Asia. After spring fades into summer, and the cold high pressure moves southward, because the climate of inland regions is dry and the sun shines copiously, the atmosphere heats up rapidly, resulting in the formation at lower strata of the atmosphere of hot, dry, changeable air masses. When north China and Jiangsu, and part of Anhui in east China, are under the situation of a high pressure in their rear and warm low pressure ahead, conditions favor formation of hot, dry wind weather. The hot, dry winds of China northwest are formed principally from the eastward movement from central Asia of a high pressure ridge, which either develops or is intensified on the Qinghai-Tibet Plateau and China's northwestern regions. Second, they result from the northward uplifting of high pressure over China's Qinghai-Tibet Plateau. Under most circumstances, the winds are usually the result of a combination of the two aforementioned circumstances.

The damage done to wheat by the hot, dry winds is generally acknowledged to be rather severe during the stages of coming into milk and the milk ripe stage. They have virtually no effect prior to flowering or after yellow ripening. When hot, dry winds occur during flowering, the anthers split and normal pollination becomes impossible, causing a lack of fruiting and an increase in the number of small panicles. When hot, dry winds occur during the in-the-milk and the milk ripe stage, formation of starch grains is impaired resulting in husks that are not filled out, a drop in the per thousand weight of grains, and a decline in output. When the hot, dry winds occur during the yellow ripe stage, a phenomenon of "early ripening" of the wheat occurs.

Meteorological indicators of hot, dry winds are usually air temperature, relative humidity, wind force and saturation deficiency. Since the circumstances vary from place to place, and the time of occurrence differs from place to place, the dry, hot wind indicators are not the same for all places. On the basis of investigation, study and experimental analysis in various places, determination of the indicators of dry, hot winds are substantially a combination of the following several circumstances:

1. Use of a combination of the maximum daily temperature, the relative humidity or saturation deficiency and wind velocity at 1400 hours. Meteorological units in Shaanxi and Gansu provinces, for example, take the maximum temperature for the day $\geqslant$ 35°C; the relative humidity at 1400 hours $\leqslant$ 25 percent, and a wind velocity at 1400 hours of $\geqslant$ 3 meters per second as an indicator of a severely hot, dry wind day. A maximum daily temperature of $\geqslant$ 32°C, a relative humidity at 1400 hours of $\leqslant$ 30 percent, and a wind velocity at 1400 hours of $\geqslant$ 2 meters per second means a light hot, dry wind day.

2. Use of a combination of the maximum daily temperature divergence and the continuous number of days of a particular wind direction (2 days or more). The Agriculture Meteorology Experimental Station in Wuwei Prefecture, Gansu Province, for example, noted the following three conditions for 2 days (or more) in a row during June and July: (1) easterly wind (monitoring at fixed times on four

occasions showed easterly winds on $\geq$ 1 occasion, and a still wind at 1400 hours); (ii) Maximum temperature for the day of $\geq$ 30°C, E divergence Δ TM $\geq$ 2°C (meaning that during June and July for many years, the difference between the maximum daily temperature average value and the maximum daily temperature); the hot, dry wind process accumulated value being $\geq$ 8°C (in the process, 1 day Δ TM $\geq$ 1°C is permissible). (iii) Daily quantity of precipitation $\leq$ 0.0 millimeters, meaning a single hot, dry wind occurrence.

3. Use of the 1400 hours relative humidity, the wind direction and wind velocity, and the strength of evaporation in combination. Xuzhou Prefecture used the 1400 hours westerly wind at 3 to 5 meters per second (grade 3), a relative humidity of 15-40 percent, an evaporation strength of 8-15 millimeters per day as a day of light hot, dry winds. When the westerly wind at 1400 hours was greater than 8 meters per second (grade 5 and higher), the relative humidity was 10-30 percent, and the strength of evaporation was 10-25 millimeters per day, this meant a severely hot, dry, wind.

4. Use of a combination of atmospheric temperature, relative humidity, wind direction and wind velocity at 1400 hours sustained over a number of days. Henan Province, for instance, used a 1400 hours atmospheric temperature of $\geq$ 25°C, a relative humidity of $\leq$ 35 percent, a wind velocity of $>$ 3 meters per second, and a wind direction of southwest or south continuously for more than 2 days to show light hot, dry winds. When atmospheric temperature was $\geq$ 30°C, relative humidity was $\leq$ 25 percent, wind speed $>$ 4 meters per second, and wind direction was from the southwest or southerly for more than 3 consecutive days, this meant severe hot, dry winds.

The damage done to wheat by hot, dry winds results from the multiple effects of diverse factors. Experience in production has shown that the degree of damage to winter and spring wheat caused by hot, dry winds is determined principally by the following three things: 1) The time of occurrence of hot, dry wind weather, the intensity, and the consecutive number of days; 2) Traits of crop varieties, stage of development and status of growth; 3) Topography, soil moisture, soil quality, and farm care measures.

Times and Areas of Occurrence of Hot, Dry Winds

Hot, dry winds may occur in China at just about anytime between April and August. It is the hot, dry winds of between May and July that damage the wheat, because it is at this time that the winter and spring wheat are entering the milk and milk ripe stages. For the winter wheat growing Xu-Huai area and the North China Plain, this is during the period of mid- or late-May or early- or mid-June; for the spring wheat growing areas of the northwest, it is from mid- or late-June to early July. It is during these times that occurrence of hot, dry winds have the most effect on wheat. A look at the distribution of the times of occurrence of hot, dry winds in China shows them arriving later and later from south to north. In the Xu-Huai area of east China, they are concentrated between 26 May and 5 June for a 36-percent frequency. In the mountain regions of western Hunan, for the last 10 years and more hot, dry winds have rarely occurred, the exception being 1964 when there was damage from hot, dry winds. In Ba County in central Hebei, hot, dry winds are most numerous at the end of May and in mid-June. Hot, dry wind weather occurs on an average of 11 days each year, 17 or 18 days in maximum years and 4 or 5 days in minimum years. But a period of hot, dry winds may endure for 1 to 3 days or for as long as 8 to 10 days at a time. In central and southeast Shanxi, they occur most frequently during early June, and a hot, dry wind period may endure for from 1 to 5 days or for as long as 8 to 9 days. In the wheat growing region at the bend of the Yellow River, mid to late June is the time when hot, dry winds are likely to be most frequent, and mostly they occur there on an average of once every 2 years. In the corridor of the western reaches of the Yellow River, they occur mostly in early to mid-June, and the probability rate is 47 percent. In the western part of the corridor, hot, dry winds are most frequent during early June. For the central region, they are most frequent during mid to late July. Over a 26-year period, hot, dry winds occurred in this region a total of 63 times during June and July for an average 2.4 times annually, or about five occurrences every 2 years. Forty-five percent lasted 2 to 3 days; 46 percent lasted 4 to 5 days, and 9 percent lasted 6 days or more. In the Tuokesun Ruoqiang region of Xinjiang, severe hot, dry winds occur virtually every year.

The area in China where wheat is damaged by the hot, dry winds is between 75-120° east longitude and 31-48° north latitude. This area includes all or part of the wheat growing region of 13 provinces, municipalities, and regions including Hebei, Shandong, Henan, Shanxi, Shaanxi, Gansu, Jiangsu, Anhui, Ningxia, Qinghai, Nei Monggol, Xinjiang and Tianjin. Damage is most severe in Hebei, Shandong, Henan, Shanxi, Shaanxi, Jiangsu, Anhui and Gansu. Effects of the hot, dry winds on other parts of China are not appreciable.

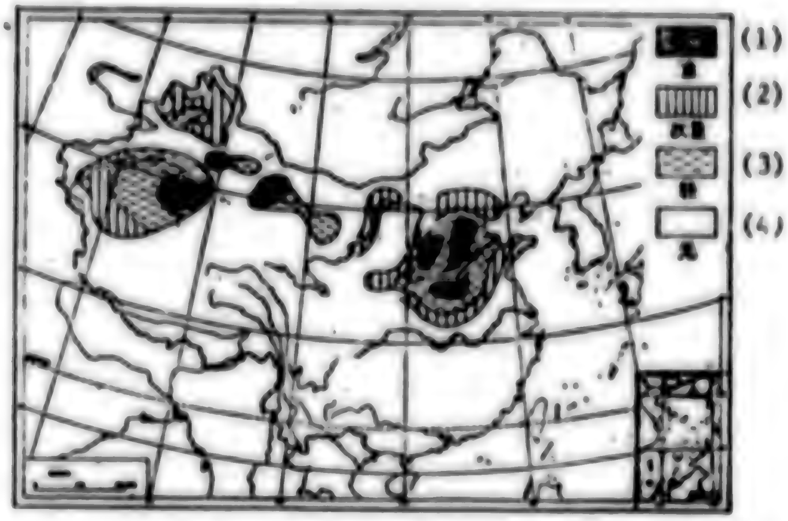
The hot, dry winds of China occur essentially before the advent of the rainy season in the northern wheat regions, which have high temperatures, aridity, much wind and little rainfall. However, inasmuch as climate, topography, cushioning properties, and the resistance of wheat itself varies, the severity of the hot, dry winds differs greatly from place to place. In terms of geographic distribution, it causes most severe damage in low-lying basins, on the edges of deserts, in mountain valleys and on the leeward slopes of mountain ranges, while damage is light in infertile hills, sandy areas and on sunny slopes. Similarly, as height above sea level increases, hot, dry wind damage decreases. Places at an elevation of more than 1,800 meters above sea level sustain no hot, wind damage. Generally speaking, areas of occurrence of hot, dry winds in China may be roughly divided in two: 1) the hot, dry wind area of the great North China Plain generally southward from the Great Wall, westward to the loess highlands, south to the Qinling and north of the Huai River, and eastward to the sea. This is the area of greatest concentration of China's wheat. This region is bisected north and south by the Taihang Mountains, and the Funiu Mountains. In the east lies the North China Plain, and in the west lies the Central Shaanxi Plain and the Fen River basin. Because of the topography, the uplifting of the mountain ranges, the subsidence of the air and the increase in its temperature, and the effects of the alkaline-saline soil in low-lying areas, damage from the hot, dry winds is severe in Hebei, Shandong and Henan, where they occur three or four or more times in 10 years, decreasing gradually along the seacoast and in the Huai River basin. In the western part of the Huang and Huai plains, they occur mostly in the eastern portion. In northern Jiangsu and northern Anhui, which are prone to waterlogging and to drought and where much late wheat is grown and where farming is careless, hot, dry wind damage has always been frequent. 2) The northwest hot, dry wind area, particularly the plain within the bend of the Yellow River, the corridor in the western reaches of the Yellow River, and the Xinjiang basin, is a major wheat growing region in China. Since this region is far from the sea, the climate is arid and it is affected as well by the deserts and the terrain. Generally speaking, hot, dry winds are more severe in basins than in mountain regions, and the Turfan Depression is the area of the country in which hot, dry winds are most severe. In the plain at the bend of the Yellow River, thanks to the screening effect of the Helan Mountains to the north and the proximity to the arid desert region in the south, the hot, dry winds are more numerous in the south than in the north. In the corridor at the western reaches of the Yellow River in the northwest to southeast direction, the height above sea level is high in the east and south and low in the west and north. As a result, in the western reaches of the Yellow River, hot, dry winds are numerous in the west and few in the east, strong in the north and weak in the south, and light at high altitudes and severe at low altitudes.

To summarize the foregoing, hot, dry winds occur virtually every year in northern wheat growing areas. However, because the in the milk and milk ripe stages for wheat come later as one travels from east to west or goes from south to north, and because of the effects of terrain and mountain ranges, the damage caused by hot, dry winds to the wheat growing area of north China occurs earlier in the east and south than in the west and north. In terms of areas, there is a great difference in extent of damage from place to place, and great changes from one year to another. All areas have done zoning of climatic laws on the basis of changes in the hot, dry winds. In Shaanxi, Gansu and Henan, for example, hot, dry winds have been charted in four grades of intensity: severe, moderate, light, and none and hot, dry wind, weather zones compiled (see map). The map shows clearly the effects of topography on the hot, dry winds, and the fragmentary distribution of hot, dry winds, which seem to diminish in severity as they radiate out in all directions from central points. The severe hot, dry wind area is concentrated substantially between 34-41° north latitude. This zoning of the hot, dry winds can provide scientific data for launching hot, dry wind forecasts, and for formulating measures to safeguard against the hot, dry winds.

Measures To Guard Against Hot, Dry Winds

The broad masses of people in China have accumulated abundant experience as a result of long struggles in production in guarding against hot, dry winds. All in all, they are mostly "avoidance," "fighting," and "prevention." 1) Use of long-term drought and flood trends to forecast hot, dry wind weather laws, and then avoiding or lessening damage from hot, dry winds by changing crop patterns and farming methods. 2) In areas where hot, dry winds ordinarily occur, measures need to be taken in accordance with weather, soil and water conservancy conditions to change cultivation techniques, to increase the capacity of the soil to retain moisture, to select early ripening, drought-resistent superior varieties, to increase ability to withstand damage from hot, dry wind weather. 3) During the season when hot, dry winds occur, use of commensurate agricultural measures to improve the macroclimate of the fields to withstand hot, dry winds.

Additionally, use of water containing wood ashes, petroleum growth promoter, potassium di-hydrogen phosphate, and such chemicals for spraying on the surface of wheat leaves to reduce transpiration and increase the water retention of the leaves and guard against the hot, dry winds has been found effective.



Sketch map showing climatic distribution of China's hot, dry winds

Key:

1. Severe
2. Moderate
3. Light
4. None

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METHODS OF REGULATING POLLINATION OF HYBRID PARENT PAIRS EXPLAINED

Shanghai KEXUE ZHONGTIAN [SCIENTIFIC FARMING] in Chinese No 5, May 81 pp 6-9

[Article by Huang Chongde [7806 1504 1795], Danyang County Agriculture Bureau: "The Knack of Hybrid Rice Seed Production"]

[Text] The amount of hybrid rice seed produced is determined by the number of panicles per mu, the number of grains per panicle, and the weight per thousand grains. It is fairly easy to increase the number of panicles through suitable enlargement of the row ratio, by increases in plant density, and by promoting early plant development, but the per thousand weight of grains has changed little over the years, and the most dynamic element affecting output is the fruiting rate. In Danyang County, the fruiting rate has changed from 7.1 to 53.8 percent during the past 5 years, and the most important element affecting the fruiting rate is the coincidence of the flowering periods. Whether or not flowering coincides is the key to success or failure in seed production. Research in Danyang County shows the criteria for most ideal coincidence of flowering for Shanyou and Siyou combinations is generally: flowering by the male parent 1 to 2 days early, assuring pollination from the beginning to the end of flowering of the female parent; onset of flowering falling short by 6 days (in the case of both the above male parents), and full flowering being closely linked.

1. Factors Affecting Coincidence of Flowering. Many factors affect the coincidence of flowering, six of the most important ones being as follows.

(1) Sowing differences: IR 661, the male parent of Shanyou No 3, has a growing period totaling between 135 and 140 days, while the female parent, Zhenshan 97A, has a growing period totaling between 96 and 100 days. The difference in growing period between the male and female parent is from 35 to 40 days. A rational difference in the time of sowing plays a decisive role in coincidence of flowering.

(2) Temperature: IR 661 comes from the Philippines, and its sensitivity to temperature is greater than that of the female parent. When it encounters low temperatures, the male parent's growth is slowed and frequently the flowering period for the female parent tends to be early. When it encounters high temperatures, the opposite is true. Therefore, in setting up different times for sowing, flexibility about temperatures should be exercised.

(3) Seeds: Whether seeds are new or old has very much to do with coincidence of flowering period. Observations show leaves to be fewer and the panicle formation

period between 3 and 5 days earlier for old seeds than for new. Therefore, when old seeds are used, appropriate readjustments must be made in the difference between sowing times.

(4) Soil quality: Different soil qualities affect development of male and female parent pairs. When soil fertility is good, both male and female parents develop early; when soil fertility is poor, development is delayed. However, the effect on the male parent is greater than on the female parent. Investigation shows soil fertility can affect the flowering period by from 2 to 3 days.

(5) Seedlings: When seedlings are sturdy and their root systems well developed, greening up is rapid, tillering early, and panicle formation between 3 to 4 days earlier than for spindly seedlings. Therefore, in seed production fields, robust male seedlings and spindly female seedlings or robust female seedlings and spindly male seedlings are to be guarded against. Male and female should be equally strong.

(6) Care: Differences in fertilization and watering directly affect the rapidity of growth and development of male and female parent pairs. When fertilization is excessive during the late stages, in particular, the period of panicle formation may be delayed to a pronounced degree, and keeping deep water on the fields for a long period of time may promote early heading by the male parent to the detriment of the coincidence of flowering.

Of all the aforementioned factors, the one affecting the coincidence of flowering most is the time of sowing, and secondly fertilizer and water management.

2. The Way to Adjust Coincidence of Flowering. Though many factors affect coincidence of flowering, they may be regulated through farming practices, the following three ways being most important.

(1) Laying a foundation of "three differences" during the early stage. "Three differences" means a difference in leaf age for the first and second group of male parents sown, difference in leaf ages of male and female parent pairs, and differences in leaf age when transplanted. Whether or not there is a difference in leaf age between the first and second group of male parents sown relates to whether the pollen will be available at both the beginning and end of the flowering period for the female parent, and whether pollen availability will coincide with the period of maximum flowering of the female parent. Given the characteristics of a short flowering period for Zhenshan 97A and V41A, the difference between the time of sowing the first and second groups of male parents should be 1.7 to 2 days and 8 to 9 days. Even when the difference in times of sowing of the male and female parent pairs is right, because of the location of female parent seedling fields, soil quality, care after sowing, and temperature variations affecting the coincidence of flowering, during the period of transplanting, a proper leaf age difference indicator is needed. For Shanyou No 3, it is about 6.5 leaves, and for Siyou No 3 it is about 7.2 leaves. If at the time of transplanting the difference in leaf ages is found to be incorrect, prompt action to regulate growth, either promoting it or controlling it should be taken by banking earth around plants, fertilizing them, or reducing watering of seedlings.

(2) Mid season care to promote balance: The overall indicators of balanced growth in male and female parent pairs during mid season are: Five or six leaves and two or three tillers on male parents, and four or five leaves and one or two tillers on female plants at the time of transplanting. Half a month following transplanting of female parent, seedlings should number between 170,000 and 200,000, and a month after transplanting, male parent seedlings should number between 80,000 and 100,000, the maximum number of tillers being between 120,000 and 150,000, and the maximum number of panicles being between 80,000 and 100,000.

In order to achieve balanced growth of male and female parent pairs, attention should be on the difficulties in early development that characterize male parents. Fertilizing should be "heavy during the early stage, steady in the mid stage, and supplementary in the late stage," much fertilization with composted organic fertilizer, fertilization with sufficient phosphate fertilizer, and early application of tillering fertilizer. For the second set of male parents granular fertilizer should be applied to guard against the plants of the first set taking away from the plants of the second set. The period of effective tillering is short for female parents. Fertilization should be "massive in the early stage, controlled in the mid-stage, and stable in the late stage," enough top dressing being given, early fertilization being done, and a heavy application of tillering fertilizer made to promote early development. In management of water, shallow irrigation should be combined with keeping the fields moist to coordinate the conflict between water and oxygen needs of the plants to promote root development.

(3) During the late period, "two earlys" assure coincidence. The coincidence of flowering periods is relative, but no coincidence is absolute. Because of the effects of diverse factors, there are always some fields in which the flowering periods do not coincide. Therefore, during the late stage, it is necessary to give attention to early forecasting of the flowering periods so as to be able to take action to make readjustments. Early forecasting of the flowering periods is a prerequisite to regulating flowering. Only when the flowering period is forecast early can early readjustments be made. The usual method for forecasting is direct dissecting for examination. Young IR 661 panicles differentiate about 32 days before heading. For Zhenshan 97A, it is about 29 days, and for V 14 about 28 days. Usually forecasting is done by dissecting the plant 30 to 32 days before heading with examination through dissecting being done once every 3 days. Prior to the fourth stage, primarily panicles on main stems are examined, and after the fourth stage, this is combined with an analysis of the entire plant. When forecasting, pay attention to the criterion that, in the male parent, panicle differentiation is one stage earlier in the first, second and third stages, one half stage earlier in the fourth, fifth and sixth stages, and slightly earlier in the eighth stage.

Provided forecasting of the flowering period has been done, early readjustments can be made. If delayed, results will not be good. Usually readjustments should be made during the second and third stages of panicle differentiation. Readjustment entails adherence to multiple measures, both the male and female parents being readjustment in order to be timely, correct, and effective. What is generally involved is selective fertilization, cutting of leaves, using dryness to control the male and moisture to advance the female, and spraying with "920" for the most part. Supplemental measures include spraying with phosphate fertilizer or with 702, slitting of buds to force the female, and borrowing a male parent, or in other words, the "four major and three supplementary" methods of regulation.

Selective fertilization. To make the male flower early, fertilize the male; to make the female flower early, fertilize the female. During the second or third stage of panicle differentiation, the male parents should be selectively fertilized with 6 to 8 jin of urea, and the female parents should be selectively fertilized with 10 to 15 jin of urea, which may readjust the flowering period by from 2 to 3 days. In fields where growth tends to be luxuriant and plant color dark selective fertilization should not be used where results would not be good.

(2) Cutting of leaves: If leaves are cut too early, stalks, stems, and spikelets florets will seriously regress, but if cutting of leaves is done too late, there will be no apparent benefits for regulation of the flowering times. The best time to cut leaves is around the sixth stage of panicle differentiation, which can delay heading by from 1 to 3 days.

(3) Dryness to control the male, and moisture to advance the female. Research during the past 3 years shows that draining of water during the fourth stage of panicle differentiation to control the male parent has little effect on the speed of leaf emergence on female parents. But speed of leaf emergence on male parents is slowed, delaying heading by about 2 days. After the fifth stage, draining of water to control the male, though also effective in delaying heading by the male parent, likewise restrains the female and delays heading. Therefore, the former "dryness to control and water to advance" should be changed to "dryness to control the male, and moisture to advance the female," which is to say that after the fifth stage, while the male parent is being controlled, the female parent rows should be watered to maintain soil mositure so as to be able to more effectively regulate flowering. In general, the flowering period may be adjusted by about 2 days.

(4) Spraying with "920": Spraying with "920" is for the purpose of delaying flowering. For male parents, spraying should be done at a concentration of 30-35 ppm; for female parents, it should be 25-30 ppm. If sprayed at the end of the eighth stage, heading can be advanced by 1 to 2 days.

(5) Spraying of phosphate fertilizer and "702": Experiments show that spraying 2 to 3 times with a 2 percent calcium superphosphate leaching solution (once every 3 days), or spraying with 40-60 ppm of "701" can advance heading by 1 or 2 days.

(6) Bud slitting to stimulate the female: When the female parent is slightly delayed, and the male parent is entering the full flowering stage, slitting of buds to advance the time of their opening can increase the fruiting rate, and can regulate by about 2 days the period of flowering.

(7) Borrowing a male parent: When the difference in flowering periods is exceptionally great, high yields may still be obtained by borrrowing male parents. Furthermore, in order to save labor in borrowing male parents, an emergency seedling may be planted every 2 to 3 chi along the walkway in the fields. This can play a definite role in increasing the quantity of pollen from the male parent in guarding against failure of flowering periods to coincide.

9432
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NATIONAL

FUNCTIONS, ACHIEVEMENTS OF NATIONAL TEA INSTITUTE OUTLINED

Shanghai KEXUE ZHONGTIAN [SCIENTIFIC FARMING] in Chinese No 5 May 81 pp 24-25

[Article by Xu Licheng [1776 4539 2052]: "Tea Institute of the Chinese Academy of Agricultural Sciences"]

[Text] The Tea Institute of the Chinese Academy of Agricultural Sciences was founded in 1958. The institute's address is Qifoshi in scenic Hangzhou's West Lake scenic area.

The institute now employs more than 160 people, the number of scientists and technicians having grown to 70 from the original 9. The institute has a personnel department, and scientific research management departments. It has seven separate research offices for tea plant culture, tea plant breeding, tea manufacture, tea plant protection, tea mechanization, tea plant physiology and biochemistry, and tea intelligence data. In addition, it has a tea experimental farm attached consisting of a more than 200 mu experimental tea bushes, a tea plant varieties garden, and a preliminary tea processing plant (including a granulated green tea preliminary refining continuous production shop).

The institute has 10 laboratories containing rather advanced scientific instruments and equipment such as high magnification microscopes, scanners, liquid chromatographs, gas chromatographs, and spectrophotometer. It has more than 20,000 volumes of books, periodicals and data. It is now in process of building a library and setting up a book, periodical, and data reading room, and an exhibition room for scientific research accomplishments. The institute published ZHONGGUO CHAYE [Chinese Tea] (a bi-monthly), GUOWAI NONGXUE -- CHAYE [FOREIGN AGRICULTURE -- TEA] (a quarterly), and GUOWAI CHAYE DONGTAI [FOREIGN TEA DEVELOPMENTS] (for internal use).

The basic mission of the institute is to formulate tea research projects in accordance with national plans for development of tea production and on the basis of key technical problems in production practice, as well as on developmental trends in tea science and technology in the world, and to conduct research on tea production techniques and scientific theories, using results of new research to promote continuous improvement and development of China's tea production and of scientific research.

In the 20 years since the founding of the institute, good achievements have been made on solving major scientific and technical problems in tea production. Numerous research results have been won in the research area, some of which have been promoted for use in the major tea producing areas of the country. Fairly outstanding have been: (1) Research that provided large area bumper output farming techniques and criteria for yields of more than 300 jin per mu of dry tea. During the 1950's, Zhejiang Province produced about 500,000 dan of tea. After summarizing and spreading large area bumper harvest techniques, tea output for the province was 1.3 million dan in 1979. Bumper output tea groves of 500, 600, or more jin per mu of dry tea steadily appeared. (2) Researched and formulated production technology and standards for production of instant black tea. China has always produced and marketed black tea that takes time to prepare, but it lacked research into the technology for making instant tea. Between 1964 and 1966, it conducted research on black instant tea technology, formulating the technology and standards for black instant tea, spreading them in the major black instant tea producing areas, giving impetus to and broadening China's production of black instant tea, and developing output from the somewhat more than 40,000 dan prior to 1964 to 520,000 dan (exclusive of 400,000 dan of the rolled black tea it takes time to prepare), earning a large amount of foreign exchange for the country to support the building of socialism. (3) Bred more than 20 superior varieties of tea shrubs including Longjing 43, Biyun, Jinju, Jinch', Ziyin, and Daye Yunfeng, some of which have been extended to cultivation. Longjing 43 sprouts early and evenly, has high output, tolerates picking, and is suited for the manufacture of Longjing tea. It has been extended to general cultivation in Longjing tea growing areas, where it has been extremely well evaluated. In 1978 it took a prize at the national science conference. (4) Researched and formulated safety standards for use of eight chemical pesticides on tea leaves, and put forward standards for safe spacing of applications of 14 pesticides, the standards for safe application of 8 of which have been incorporated into the provisional experimental use standards published by the state, and which are currently being promoted throughout the country, to play a major role in guarding against pesticide pollution of tea leaves. (5) Researched, and designed a series of red and green tea prototype machines to transform the former backward situation of hand operations in producing tea, tea output achieving sudden development thereby. The successful development of a wilting trough [5494 0406 2864], in particular, gave powerful impetus to development of black tea production. (6) With the help of units concerned, tea picking machines were developed. These included the hand-operated Nancha 7024, the hand-operated SG-I type, the electrically operated DC-I type, the mechanically operated JW-325 type, and the 4CW 850 type carried by two people. Experiments in product have shown the JW-325 to be 20 times more efficient than hand picking, and the RCW850 type to be 200 times more efficient than hand picking. The completion rate for the picking of fresh leaves and budding leaves is greater than 70 percent. The two-person operated 4CW850 type tea picker, in particular, is highly efficient, has good economic characteristics, and is convenient to operate. It is currently the most satisfactory tea picker, and it will open broad vistas for the early mechanization of tea picking in China. (7) Successful research in multiple uses of tea seeds found methods to refine tea seed oil and to analyze, extract, and use tea saponin [5420 4103 4790]. In addition to the pressing of edible oil from tea seeds, after the oil has been pressed out, tea saponin can be extracted from the remaining tea seed cake for use in making shampoo xiangbo [7449 3134], and increasing the suspension rate of miscible 666, for protecting dyes in textiles, and for making textile color-fast. Tea saponin is currently undergoing promotion for trial use in production in the chemical and silk industries. In 1980, this research achievement won a national technical improvement award.

In the realm of tea leaf biochemistry, research was done on an analysis of the chemical constituents of tea leaves, and a book titled "Handbook of Tea Plant Physiology and Tea Leaf Biochemical Experiments" was written. This book played a major role in promoting research on tea plant physiology and tea leaf biochemical theory. In addition, fairly good achievements were made in probing tea leaf physiology, particularly in chemical appraisal of quality of black instant tea. In response to national agriculture and animal husbandry scientific and technical development plans, and to problems in tea production urgently requiring solution, near-term scientific research tasks were formulated, principal of which were the following: (1) Survey of tea shrub variety resources and maintenance of them for use; (2) Tea shrub zoning; (3) Breeding of superior tea shrub varieties and new breeding techniques; (4) Comprehensive culturing techniques and laws for consistently high yields of high quality teas; (5) Comprehensive disease and insect pest prevention and control techniques for tea shrubs; (6) Techniques for improving quality of black and green teas; (7) Mechanization of tea production; (8) Basic tea shrub physiological and biochemical theory.

Additionally, in accordance with major research tasks handed down by the state, the institute took responsibility for organizing tea research units and pertinent agricultural school forces to launch cooperative research.

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BRIEFS

FARM CROP SUBSIDIES--ZHONGGUO CAIMAO BAO [CHINA FINANCE AND TRADE JOURNAL] has reported that the many year policy of using public funds to subsidize disparities between procurement and market prices and operating expenses related to increase in uniform procurement prices and stabilization of uniform market prices for grain, cotton, and oils has demonstrated the concern for the livelihood of the people of the party and government. Grain department and national supply and marketing cooperative statistics show that the 1980 increase in the uniform procurement price paid for grain, cotton. and oil, and institution of an increased price for production procured in excess of quotas has meant a more than 9 billion yuan increase in peasant income, or an average 11 yuan more per peasant. State financial institution price subsidies for grain, cotton, and oils, when added to existing subsidies, totaled more than 13.5 billion yuan (not counting subsidization of foreign trade losses for the importation of grain) in order to maintain stable the market prices of grain, edible oil, and cotton for wadding, cotton yarn, cotton cloth, and knit goods. City and country people have not had to increase their cost of living as a result of increases in the procurement prices paid by the government for grain, cotton, and oils. [Text] [Beijing RENMIN RIBAO in Chinese 25 Jun 81 p 1] 9432

PORK PRODUCTION DROPPING--In 1980, the production of meat in China totaled 23.2 billion jin, and the state's expenditure on the purchase of pigs was 15.7 billion yuan, averaging over 20 yuan per peasant. However, some serious problems have emerged despite this fine situation. Currently many localities are raising fewer sows, the price of piglets has dropped, and the number of pigs being raised has reduced. Some areas even have reimposed restrictions on raising and butchering pigs. Consequently, the supply of pork is becoming inadequate, and some provinces and autonomous regions have restored supply quotas on pork. At the present, over 90 percent of the meat and eggs on sale at the markets is produced by families of commune members. [Beijing NONGCUN GONGZUO TONGXUN (Rural Work Newsletter) in Chinese No 5, 1981 p 15]

CSO: 4007/513

ANHUI

ALL-TIME BUMPER SUMMER HARVEST REPORTED

Beijing RENMIN RIBAO in Chinese 30 Jun 81 p 4

[Article: "Heartening Bumper Harvest in Anhui Summer Grain Crops; Output Totals 8.4 Billion Jin, a More than 1.1 Billion Jin Increase Over Last Year"]

[Text] Anhui Province's more than 30 million mu of summer grain crops have produced a heartening bumper harvest this year. Output totals 8.4 billion jin, a more than 1.1 billion jin increase over last year, to create an all-time record.

Last year was the first year in which the major wheat-producing areas of Anhui Province instituted various forms of a system of responsibility, principally of the kind whereby production quotas are fixed on a household basis, and jobs are contracted out to households. After institution of this system of responsibility, commune members "wished they could grow two more hands to work." Commume members described their own zeal for work as, "wresting oil from the yellow soil." In Fuyang Prefecture, where wheat yields have long been low, this year's output of wheat from 11 million mu of land totaled more than 2.8 billion jin, a more than 200 million jin increase in output over the all-time high year of 1979. This year households having 10,000 jin wheat outputs is no longer considered news in Anhui.

Anhui peasants frequently say that policies and science are the two wings of agriculture; when either oneis lacking, flight becomes impossible. Since last year, accompanying general promotion of a system of responsibility for production, a "craze for scientific farming" has surged throughout the province and has permeated every household. Formerly whereas peasants visiting from door to door or going to market talked about inconsequentials, now when they open their mouths it is to ask, "What seeds did you plant; how much fertilizer did you put down; what diseases and insect pests are going round?" As soon as prefecture or commune farm technicians leave their homes, they are surrounded by a crowd of peasants asking them to explain all sorts of difficult problems.

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ANHUI

BRIEFS

WATER CONSERVANCY, AGRICULTURE--In the past 31 years, Anhui Province improved 392 waterways totaling 8,830 kilometers, built 16,352 kilometers of dikes and 4,257 reservoirs with total storage capacity of 12.3 billion cubic meters, completed 1,523 sluices, developed 317 irrigation zones each covering over 10,000 mu of farmland and removed 12.9 billion cubic meters of stone and earth. In 1980 the province had 112,000 motor-pumped wells, 4,070,000 mu of irrigated farmland, 27,210,000 mu of farmland that guaranteed harvests regardless of drought or waterlogging, 9,037,700 hp of farm machinery, 17,562 large and medium-sized tractors, 116,992 hand tractors and 4.96 million hp of machinery for farmland irrigation and drainage. By 1980, the province had electrified 2,438 communes. The rural areas consumed 1,068,690,000 kwh of electricity and used 2.45 million dun of chemical fertilizer on farmland. In 1980 the province's output of grain, cotton, oil-bearing crops and tea were respectively 29,077,600,000 jin, 2.44 million dan, 9,959,800 dan and 639,900 dan. It had 2,915,100 draught animals, 11,141,100 hogs, 3,832,700 goats. In 1981, the province expects to reap 8.4 billion jin of summer grain and more than 1 billion jin of rapeseed. [OW290119 Hefei Anhui Provincial Service in Mandarin 1100 GMT 27 Jun 81]

SUMMER GRAINS--As of 25 June, the food departments in Chuxian Prefecture, Anhui, procured more than 145.37 million jin of summer grains from the masses, overfulfilling the state procurement quota by 79.5 percent. It is estimated that the total grain output may reach 938 million jin, more than 20 percent increase over that in 1980, and that the per-mu yield may reach more than 300 jin. [OW121434 Hefei Anhui Provincial Service in Mandarin 1100 GMT 5 Jul 81]

WHEAT PRODUCTION--The masses in Guzhen County, Anhui Province, have reaped a bumper wheat harvest from 700,000 mu of land. The total output exceeded 190 million jin, increasing by more than 40 percent over last year's figure. [OW121434 Hefei Anhui Provincial Service in Mandarin 1100 GMT 5 Jul 81]

GRAIN PRODUCTION--The masses in Laian County, Anhui Province, reaped a bumper grain harvest in 1980 with total output reaching 405 million jin, a 15.66 percent increase over the previous year's figure. [OW121434 Hefei Anhui Provincial Service in Mandarin 1100 GMT 5 Jul 81]

CHAOHU PREFECTURE RAPESEED--Hefei, 10 Jul (XINHUA)--By 25 June, Chaohu Prefecture, Anhui Province, had purchased 194.17 million jin of rapeseed, almost doubling the total amount for 1980. [OW141223 Beijing Xinhua Domestic Service in Chinese 0047 GMT 10 Jul 81]

SHOU COUNTY AUTUMN CROPS--Shou County, Anhui, is taking measures to insure a bumper harvest of autumn crops this year. In 1981, the county plans to reap 900 million jin of grain, of which 600 million jin will be autumn grain crops. Now the county's 1 million mu of paddy rice, 200,000 mu of dry grain and 300,000 mu of oil-bearing and economic crops are growing well. [OW141223 Hefei Anhui Provincial Service in Mandarin 1100 GMT 13 Jul 81]

CSO: 4020/225

GOOD PROSPECTS FOR INCREASED ROSIN PRODUCTION ANTICIPATED

Fuzhou FUJIAN RIBAO in Chinese 25 May 81 p 2

[Article by Zhang Anggui [1728 2491 6311]: "Great Prospects for Rosin Production"]

[Text] Fujian Province has abundant pine forest resources. Existing pine forest reserves amount to 120 million cubic meters of which forest reserves able to supply resin amount to 86 million cubic meters, or an annual reserve of more than 300,000 tons. Last year the province produced 91,600 tons of pine resin, using only one-third the annual reserve. At the present time, use of pine forest reserves is also not balanced. In Longyan Prefecture, the pine forests produce resin at an average 4.08 shijin per cubic meter. Jianyang Prefecture's pine forests average 1.9 shijin per cubic meter, and Sanming Prefecture's pine forests average a resin output of 1.05 shijin per cubic meter. In terms of the current level of resin tapping, Fujian Province still has a great potential for the production of rosin. Fujian Province is sub-tropical and its masson pines may be tapped for resin usually after they have grown for 25 to 30 years. Masson pines have a trunk diameter of 32 centimeters, and each tree may be tapped for 15 shijin of resin annually for a value of 2.80 yuan. With sensible tapping, each pine tree may be tapped for 20 years.

Rosin is currently a product in short supply in the national economy. It has a wide range of uses in light industry, the chemical industry, metallurgy, and war industries. More than 60 trades and industries and more than 600 different products require rosin and turpentine. At the present time sources of supply of rosin goods for the international market are inadequate, and both foreign market prices and the quantity sold abroad are on the rise. Last year, Fujian Province exported 29,700 tons of rosin, earning $20.06 million in foreign exchange, or almost one-third the total value of exports of native products. Rosin production entails a small amount of labor for large benefits and quick results. A single adult laborer can usually care forand tap about 700 pine trees for the production of more than 7,000 jin of resin a year. Factory processing of a ton of resin accumulates more than 240 yuan for the state. Last year, Fujian Province produced 91,600 tons of resin, generating 37 million yuan of funds in brigades and communes. Production of 60,438 tons ofrosin provided the state a profit of 9.25 million yuan and the payment of 2.17 million yuan in revenues.

The following several problems await solution if Fujian Province's rosin is to develop rapidly.

First is continued eradication of the effects of the "leftist" mentality. Formerly, commune members who individually tapped resin were criticized for operating sideline occupations by themselves. Now the influence of the "leftist" mentality has not yet been completely eradicated, and in many places problems exist of "quotas that rise every year and costs that go up every year," and the fixing of management fees of many descriptions that increase the burdens on resin farmers. Unless these problems are promptly solved, rosin production will be unable to increase. In addition to eradication of "leftist" ways of doing things, all major production areas should treat development of rosin production as part of comprehensive utilization of forests.

Second is the need to establish and perfect a system of responsibility for resin production. Resin tapping is arduous work. It is a strongly labor intensive individual occupation requiring technique for its accomplishment. In accordance with these characteristics, a system of responsibility should be promoted of "planning for production teams, fixing of output quotas on a household basis, guaranteed tapping and guaranteed care with rewards for output in excess of quotas," in a combination of tapping and care. Such a system of responsibility could make maximum use of the workforce and the potential provided by forest resources, and arouse the initiative of millions upon millions of households.

Third is regulation of the forests in accordance with law. There must be strict supervision and management of forest resources, and those who violate regulations on tapping operations, or who wantonly tap or cut trees resulting in their death being fined in punishment, responsibility fixed in accordance with the seriousness of the offense.

Fourth is reformof the existing management system. The 43 rosin plants throughout the province are divided in their management between forestry and industrial departments, and their output is procured, marketed and sold by both commercial and foreign trade units. Because of the multiple leadership, there are many abuses. It is recommended that the province set up a forest products chemical company for unified operations with fiscal profits reverting to locales, and profits being divided between province and counties. This would be beneficial in strengthening of administration and management of enterprises and in improving economic benefits. At the same time, regulations should be implemented on the division of rosin products in excess of quotas, concern being given to the welfare of the state, the collective, and individuals.

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BRIEFS

SPRING TEA HARVEST--Spring tea production totaled over 280,000 dan in Fujian this year, an increase of more than 30,000 dan over last year's. Some 470,000 mu of new tea plantations were set up in recent years. [Hong Kong ZHONGGUO XINWEN in Chinese 20 Jun 81 p 5]

SWEET POTATOES--By the end of June Fujian Province had planted 1.45 million mu of sweet potatoes, topping last year's same period by 150,000 mu. [Fuzhou Fujian Provincial Service in Mandarin 1120 GMT 10 Jul 81]

SOYBEAN PRODUCTION--Jinjiang Prefecture, Fujian Province has reaped a good harvest of spring soybean. The harvest of its 210,000 mu of spring soybean has been basically completed with an average per-mu yield of 178 jin. The total output of spring soybean may reach 30.8 million jin. At present, the state has already procured 2.7 million jin of spring soybean from the prefecture. [Fuzhou Fujian Provincial Service in Mandarin 1120 GMT 13 Jul 81]

FORTY PERCENT INCREASE IN RAPESEED--The broad masses of commune members in the rural villages of Putian Prefecture are hurrying to sell their rapeseed. As of 21 May, 2.86 million jin had already gone into warehouses, for a 43 percent overfulfillment of unified purchase quotas. Last winter this prefecture liberalized policies to permit communt members the use of some winter fallow land for the growing of rape. The province's rape growing area amounted to 106.000 mu, a 35,000 mu expansion over the previous year. Output totaled more than 9 million jin, a more than 40 percent increase, to create an all-time high. Following the bumper rape harvest, commune members actively sold rapeseed to the state. Fuqing County sold more than 980,000 jin, one-third the prefecture's uniformly purchased total quantity. In Minqing County, which was formerly oil short, this year commune members sold 47,000 jin of rapeseeds, double the quantity sold last year. It is anticipated that the quantity of rapeseeds to be placed in storage throughout the prefecture will amount to more than 3 million jin. [Text] [Fuzhou FUJIAN RIBAO in Chinese 24 May 81 p 1] 9432

CSO: 4007/463

GUANGDONG

CHANGES IN CROPPING PATTERNS, SOIL IMPROVEMENTS REPORTEDLY INCREASE OUTPUTS

Guangdong NANFANG RIBAO in Chinese 15 Jun 81 p 1

[Article by Reporter Tan Shimou [3282 0057 6180] and Correspondent Lu Binahai [7120 3057 3189]: "Doumen Adapts General Methods to Local Situation To Open Door to Wealth Through Development of Agriculture; Hovering of Grain Output Despite 14 Years of Sole Emphasis, But Vastly Changed Situation After a Single Year of Rational Crop Distribution; Entire County Had Tremendously Increased Production and Income Last Year; Total Output of Paddy Rice, Sugarcane, and Pond Fish Exceeded All-Time Highs; Per Capita Distributions Aferaged From 107 to 182 Yuan"]

[Text] Doumen County, where agricultural production has long fluctuated without forward movement, has smashed the bonds of "leftist" thinking, and adapted general methods to local situations for a readjustment of the pattern of production, last year producing the greatest achievements in 15 years in the county's organizational system. Despute a 9,100 mu reduction in the rice average, togal output increased eight percent over the all-time record. Output of sugarcane and pond fish showed a more than 20 percent increase, and gross agricultural income increased 30 percent. Even while collective accumulations increased by 50 percent, per capita distribution spurted up from the previous year's average 107 yuan to 182 yuan.

Doumen County is located at the mouth of the Xi Jiang in the Pearl River System. It is a sandy field area of few people relative to the amount of fields. Here typhoons and ocean waves frequently cause natural disasters. The terrain is low-lying. Winter and spring bring salinity, and summer and fall bring watterlogging. Conditions for rice production are rather poor. But the area is traversed by rivers; the land is fertile; andsuperior conditions exist for development of diversification. Shackled by the "leftist" mentality, this county formerly was unable to plant in accordance with the local situation, and so the potential for agricultural production could never be tapped. For example, the low-lying sandy fields taht make up more than one-half of the county's cultivated land area, and are frequently waterlogged, produced only about 600 to 700 jin per mu of rice annually. The 70,000 mu of saline fields where the river empties into the sea are damaged by salinity for as long as 7 months of every year, and annual rice yields are no more than 400 jin or so per mu. In order to make the most of strengths and play down weaknesses for the development of agriculture, as a result of long experience in production, the masses long ago figured out comprehensive control of low-lying sandy fields and conversion of saline fields to the growing of sugarcane. However, as a result of the one-sided emphasis on the growing of rice and devotion of the area solely to rice, these successful experiences suited to the local situation could never promoted. In the 14 years between 1965 to 1978, the county's annual rice yields were only 800 jin per mu annually, and commune member annual per capita income fluctuated for a long time around 100 yuan.

Following the Third Plenary Session [of the 11th Party Central Committee], the Duomen County CCP Committee resolutely corrected the one-sidedness in the guidance of production, and gradually made substantial readjustment in the pattern of agricultural production throughout the county. Last year, largely as a result of renovation of low-lying sandy fields and changes in the crops grown in saline fields, growing of sugarcane was expanded by 9,700 mu, 1,500 mu of fishponds were dug, and the rice growing area was reduced by 9,100 mu. With regard to the low-lying sandy fields, the experiences of the Xinsan Production Brigade of Baijiao Commune and of Yintan Brigade in Liuxiang Commune were followed in digging ponds and building up the height of the fields. This meant use of abandoned composting pits and some low-lying fields to dig fish ponds, using the excess dirt to build up the height of the fields. Additionally, the rim of the ponds were used for the growing of sugarcane; hogs were raised at the ends of the ponds; pig dung was used to fatten the fish, and pond sediment used to fertilize the fields to form a benign circular system in which grain, sugarcane, fish, and hogs were mutually supportive. In the case of the saline fields, it was making the most of advantages while avoiding disadvantates. Within the limits of existing cane crushing capacity, a change was gradually made to the planting of wind resistant, salt tolerant sugarcane. After these two actions were taken, striking economic benefits followed. Niwan Commune, located at jitimen, decisively halted preparations last year for the time consuming construction of the Niutang reservoir and a project to divert fresh water to get rid of salinity, concentrating limited funds, manpower, and materials instead on the current year's agricultural production. The commune changed the 1,300 mu most severely damaged by salinity to the growing of sugarcane, thereby not only avoiding losing it to wasteland, but also as a result of the shrinkage of the ricefield area, putting the fresh water to concentrated use. They also staggered in separate seasons the growing of rice and sugarcane, with benefits for insentive cultivation of both. This, plus other measures, increased the communes output of rice by 1.05 million jin, and total output of sugarcane doubled. Per capita distributions rose from 164 yuan to 279 yuan, making the commune the one with the highest distributions in the county in a single jump. Last year, the comprehensively renovated low-lying fields in the county amounted to 30 percent of the early and late crop ricefield area and sugarcane growing area. The increased 18.65 million jin of paddy they produced amounted to more than 60 percent of the total increase in paddy output in the county. Increased output of sugarcane totaled almost 10,000 tons, an average increase of 1.7 tons per mu. Pond fish output increased by 340,000 jin. In Baijiao Commune, where the comprehensively renovated area was 40 percent of the total, great increases occurred last year in output of paddy rice, sugarcane, and pond fish, and income greatly increased took with average per capita distributions reaching 230 yuan. Each person provided the state an average 1,019 jin of grain and 500 jin of white sugar to exceed the all-time high record by 261 jin and 118 jin respectively.

Doumen County has shouldered a heavy commodity grain production task. For the past 2 years, the County CCP Committee has adopted an active and steady program for readjustment of the crop pattern. For example, once some communes and brigades had successfully renovated low-lying sandy fields, the County CCP Committee decided on planned stage-by-stage renovation of more fields, first expanding the experiment in 1979 to 16 brigades. This showed that large area digging of ponds and raising of the fields was able during that year to increase yields by 100 jin per mu of paddy or 1 more than 1 ton of sugarcane. Each mu required 100 jin less of ammonium carbonate, and a total of t[illegible] yuan per mu was saved on mechanized cultivation expenses and electricity expenses for drainage of water. The brought about increased production, increased incomem increased contributions, and increased distributions for the year. Last year the renovation of low-lying sandy fields was expanded to 68 brigades, each of the brigades winning great increases in production and earnings. Some brigades decreased the low yield rice growing areas, yet total rice output showed tremendous increase, enabling fulfillment of state grain requisition purchase quotas that had been owing for a number of years. Last year, the country provided more than 93 million jin of commodity grain, an average of 713 jin per person engaged in agriculture, and 164 jin more than during the previous year. Production of white sugar averaged 643 jin per person, 141 jin more than in the previous year, making the county first in the province.

9432
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RICE BLAST PREVENTION, CONTROL WORK CONTINUES

Guangzhou NANFANG RIBAO in Chinese 28 May 81 p 1

[Article by Lai Zhenru [6351 4176 1172]: "Commune Members Throughout the Province Active in Prevention and Control of Rice Blast; Overcoming Disadvantageous Factors to Win a Bumper Harvest from the Early Rice Crop"]

[Text] In view of the widespread occurrence of rice blast, rural cadres and the masses of commune members throughout the province have seized the opportunity to take action in active prevention and control of rice blast.

As a result of the fairly large number of rainy days and little sunshine since April, cropland moisture is high. Additionally, the area planted to varieties susceptible to disease is large, and some places have fertilized with nitrogenous fertilizer. All this has brought about widespread outbreaks of rice blast in the early crop, particularly in areas chronically afflicted with disease, and in mountain areas. Recent incomplete statistics from Guangzhou Municipality, and Huiyang, Zhanjiang, Meixian, Shaoguan, and Zhaoqing prefectures show a 1.3 million mu area afflicted with rice blast, and the rate of leaf infestation is generally between 30 and 40 percent, or as high as 50 percent or more.

While giving attention to the draining of water and the airing and sunning of fields, and to fertilizing with nitrogenous fertilizer to increase the disease resistance of seedlings, using their knowledge of the occurrence and characteristics of rice blast, all locales have promptly applied pesticides for the prevention of spread of the disease. The Rengtu Commune in Bolo County has invited county agricultural technicians to give talks to commune and brigade cadres on prevention and control of rice blast. They have also used propaganda broadcasts to spread knowledge of disease control and to promote elimination of rice blast throughout the commune.

While preventing and controlling rice blast, all jurisdictions have also done diligent work in forecasting, giving close attention to progress of the disease, doing a good job of fertilizer and water management, carefully applying sidedressings of fertilizer during the period of panicle formation, and preparing to continue pesticide prevention and control work during the period from beginning to completion of panicle formation in the early crop to triumph over disease and insect pests and assure a bumper harvest from the early crop.

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CHARACTERISTICS OF 'GUICHAO NOS 2, 13' RICE COMPARED

Guangzhou GUANGDONG NONGYE KEXUE [GUANGDONG AGRICULTURAL SCIENCES] in Chinese No 3, 8 May pp 9-11

[Article by Huang Guizhang [7806 2710 4545], Rice Institute, Guangdong Provincial Academy of Agricultural Sciences:" Analysis of Significant Differences in Output and Major Economic Characteristics of "Guichao No 13" and "Guichao No 2"]

[Text] Beginning in 1979, the Rice Institute of the Provincial Academy of Agricultural Sciences issued "Guichao No 13" (hereinafter termed "No 13"), a sister line of "Guichao No 2" (hereinafter termed "No 2") to some prefectures for experimentation and authentication. As a result, some units felt that output from "No 13" was greater than from No 2," that its fruiting rate and per thousand grain weight were superior, and that tolerance of cold during the seedling stage of the early crop was stronger. Others, however, held different views. Just which is superior, "No 13" or "No 2"? Are there any differences in the output and other characteristics of the two? In order to illucidate these problems, the writer conducted an analysis of pertinent experiments with the 1979 and 1980 early crop, which has been compiled into a report.

(1) Experimental Materials and Methods

The investigation and analysis of "No 13", and "No 2" included 9 subjects, namely yield, effective number of panicles, numbers of grains per panicule, fruiting rate, per thousand weight of grain, plant heights, length between the first and second elongation nodes, and length and width of boot leaves. Significance testing of the mean differences between each of the two lines was done using matched and unmatched t-value mensuration methods and determination of the percentage of interval differences. (Formula omitted).

(2) Results of Experiments

1. Output: For the 1980 early crop, comparative yield data was collected from 22 units in 8 prefectures and municipalities in the province. Overall average yields

1. The various statistical data in this article were compiled with the help of comrades Ye Xiaoying [0673 1420 7751] and Jiang Yanfang [3068 7158 5364], for which appreciation is particularly expressed.

of 907.82 jin per mu were shown for "No 13," and 896.14 jin per mu for "No 2." The former showed average increased yields of 11.68 jin more than the later, for a 1.30 percent rate of increase. Fourteen sites, or 63.6 percent of the total, had increased yields with rates of increase of from 2.2 to 83.4 jin (+0.2 - 9.3 percent) and average yield increases of 35.76 jin (+4.0 percent). Two sites had extremely significant increases in yields; 1 site had significant increases in yields, 9 sites had insignificant increases in yields, and 2 2 sites had no measureably significant increases in yields. Six sites, or 27.3 percent of the total, showed reduced yields, the degree of decrease being from 11.0 to 84.0 jin (-1.2 - -9.4 percent), or an average decrease of 40.60 jin (-4.5 percent). Two sites had extremely significant decreases in yields; 2 sites had not very significant decreased yields; and at 2 decreased yield sites there was no measurably significant decrease in yields. An average 2 sites, or 9.1 percent of the total, used paired t-value determination methods to confirm that though "No 13's" yields per mu averaged slightly higher than "No 2's", the difference was not significant.

2. Number of effective panicles: Thirty adjacent plants of each variety were taken for examination from the institute's 1980 early crop variety comparison experimental fields (measuring 6x5 cun of individual plants). Examination showed the average number of effective panicles on "No 13" to be 9.37, and on "No 2" to be 10.4, the former having 1.03 fewer panicles than the latter. Results of use of the non-matched method of determining the significant difference in the number of effective panicles of the two lines showed that though the number of effective panicles on individual "No 13" plants was fewer than on "No 2," the difference did not reach significant levels.

Examination of 30 plants of each variety taken from the same year's crop in the institute's small variety comparison experimental field (measuring 6 x 5 cun, each plant group having 8 individual seedlings), showed the number of effective panicles for "No 13" to average 12.85 per plant while "No 2" averaged 12.20, the former having 0.65 more panicles than the latter. Using the unmatched method of determination, the difference in the number of effective panicles of the two lines was shown to be insignificant. This was the case for determination of individual and numerous plants alike.

3. Number of grains per panicle: Examination was conducted on 10 plants of each line taken from the institute's 1979 early crop highly fertile variety comparison area to observe whether there was any significant difference in the average number of grains per panicle of "No 13" and "No 2." The number of grains per panicle numbered 105.95 for "No 13," and 93.28 or 12.67 grains more for "No 2." ("No 13" averaged 12 effective panicles per plant as compared with 12.25 panicles per plant for "No 2," the two being very close). Using the unmatched method of determination, though "No 13" had a larger number of grains per panicle then "No 2" the difference was not significant.

Specimens for examination were selected from the institute's 1980 early crop variety comparison area for the purpose of confirming whether the results of measurements made of the 1979 early crop would be the same. This examination showed the average number of grains per panicle to be 114.04 for "No 2," and 108.31 for "No 13," the former having 5.73 more grains. (Actually total number of grains for "NO 13" were greater than for "No 2," since the total number of panicles on 10 "No 13" plants was 132 for a total of 14,296.92 grains, while 10 "No 2" plants had 120 panicles and a total of 13,684.8 grains, the former having 612.12 more grains than the latter, i.e. an average 61.21 more grain per plant). Similarly, use of the unpatched method t-determinaion showed no significant differences in the number of grains per panicle for "No 2" and "No 13."

4. Fruiting rate: Ten of each kind of plant were selected for examination from the institute's 1979 early crop low fertility variety comparison area. Results of analysis of the difference in fruiting rate for the two lines showed "No 2's" fruiting rate to be 82 percent, and "No 13's" to be 87 percent, "No 13" being 5 percent higher than "No 2." Application of the t-determination method for percentage of interval difference showed that though the fruiting rate for "No 13" was somewhat higher than for "No 2," it did not reach significant levels.

Ten samples of each kind of plant were selected for examination from the institute's 1980 early crop high fertility variety comparison area. As a result of a 6-force typhoon, some of the varieties had lodged and sprouted, impairing the fruiting rate. Fruiting rate for "No 13" was only 79 percent; for "No 2," it was only 73 percent, the former being 6 percent higher than the latter. Use of the aforementioned method of measurement showed "No 13's" fuuiting rate to be slightly higher than "No 2's," but not reaching a significant value. Measurement results were identical for the 2 years.

5. Per thousand grain weight: Comparison was made of the per thousand grain weight of the two lines on the basis of material collected from the 1980 early crop at 14 variety comparison sites in the province. At 8 of the 14 sites, the per thousand weight of "No 13" grain was heavier than "No 2's," by an average 0.74 grams and ranging from 0.1 to 1.4 grams. At 5 sites, it was lighter by an average 0.36 grams and ranging from 0.2 to 0.8 grams. The difference in per thousand grain weight from 1 site was zero. The overall average per thousand grain weight at the 14 sites was 25.82 grams for "No 13," as compared with an average 25.53 grams or only 0.29 grams more for "No 2." Use of the paired method of t-determination showed the per thousand weight of "No 13's" grains to be slightly heavier, but the former was not significantly heavier than the latter.

Results from 36 experimental sites throughout the province on the early crop for the same year showed the overall average per thousand grain weight of "No 13" to be 25.4 grams, and of "No 2" to be 25.2 grams, "No 13" being 0.2 grams heavier than "No 2" determination of t showed no significant difference in weight per thousand grains for the two.

6. Plant height. Twenty plant specimens were selected for checking from the institutes 1980 early rice crop variety comparison experimental fields for measurement of plant heights. "No 2" averaged 96.85 centimeters, and "No 13" averaged 96.25 centimeters, "No 2" being 0.6 centimeters taller than "No 13." Use of the unpaired method of determination showed no significant differences in height of the two. Material taken from the institute's 1979 early crop variety comparison fields also showed the average plant height of "No 13" to be slightly greater than "No 2's," but the difference was not significant.

7. Distance to the first node up from the ground: Some units have reported that "No 13" is more prone to lodging than "No 2." For this reason the writer checked the degree of significant difference in the distance to the first node up from the ground for the two lines. For "No 13," the average length to the node was 2.33 centimeters; for "No 2" it was 1.79 centimeters, the former being 0.54 centimeters longer than the latter. Using the unpaired method to determine t, results showed the distance to the first node up from the ground to be significantly longer on "No 13" than on "No 2," but not reaching an extremely significant value.

Results of measurements show the distance to the first node up from the ground to be significantly longer for "No 13" than for "No 2," and this may be one of the reasons why "No 13" is more prone to lodging.

8. Elongation to the second node above ground. Using the same number of plants as above from each of the two varieties, the elongation to the second node above ground was measured. Results showed an average 5.97 centimeter length for "No 13," and an average 5.90 centimeter length, or 0.07 centimeters longer, for "No 2" for an infinitesimal difference. Testing for values showed the difference in elongation to the second node of the two varieties to be insignificant.

9. Length and width of boot leaves. During the period of full heading of the 1980 early crop, length and width of boot leaves of "No 13" and "No 2" were checked. Results showed "No 13's" boot leaf length to average 29.50 centimeters as compared with 31.85 centimeters, or 2.35 centimeters shorter for "No 2." Determining the t-value through use of the unpaired method showed that though boot leaf length for "No 13" and "No 2" was different, the value was not significant.

The same materials and methods were used to check the width of boot leaves. Results showed an average value of 1.600 centimeters for "No 13," and 1.606 centimeters, or 0.006 centimeters narrower, for "No 2." The difference between the two was infinitesimal and not of significant level.

(3) Brief Summary

To summarize the foregoing. Overall average yields per mu, number of effective panicles, number of grains per panicle, fruiting rate, per thousand weight of grain, and such economic characteristics were all slightly better for "No 13" than for "No 2."

Extensive comparative testing of 1980 early crop "No 13" and "No 2" done at various places in the province showed increase in yields to be greater and decrease in yields to be less from the farming of "No 13" (the principle reason for reduced yields being panicle neck blast). In order to make the most of advantages, and to exploit strengths while avoiding weaknesses, the writer believes that wherever "No 13" is successfully grown, it may be gradually extended in cultivation for steady exploration of its culturing characteristics in a promotion of both superior varieties and superior methods. Wherever preliminary experiments show yields less than those obtained from "No 2," further testing should be done, and wide area promotion should not be hurried. In places where rice blast is serious, careful consideration should be given.

All locales also report tolerance to cold during the early period of growth and tolerance of heat during the late period of growth of "No 13" early crop as somewhat better than for "No 2." During the later stage of ripening, boot leaves of "No 13" do not dramatically turn yellow. Resistance to sheath and culm blight and bacterial blight is essentially the same for both varieties, but resistance to rice blast is not as good for the former as for the latter. Therefore, in test planting or extending cultivation of "No 13," all locales should consider these characteristics.

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GUANGDONG

CHARACTERISTICS OF THREE NEW HYBRID RICE VARIETIES REVEALED

Guangzhou GUANGDONG NONGYE KEXUE [GUANGDONG AGRICULTURAL SCIENCES] in Chinese No 3, 8 May 81 pp 40-42

[Article: "Briefing on Several New Varieties of Superior Quality Paddy Rice"]

[Text] (1) "Jinli Xinsizhan"

"Jinli Xinsizhan" is a variant plant discovered in a "Xinsizhan" plant colony of the late crop in 1972 by the Haitang Science and Technology Team of Duanfen Commune in Taishan County. Cultivated by the Duanfen Commune Farm Science Station, it was systematically bred to become a late crop early intermediate maturing rice variety. In 1979 it was part of the province's regional tests of superior quality paddy, and statistics from 10 sites averaged 646.5 jin per mu to put it in first place. As a result of evaluation and approval by the Guangdong Provincial Grain Department, it was evaluated as superior quality paddy meeting requirements for export in foreign trade.

In 1980, Taishan County planted more than 120,000 mu to this variety,and with timely care and fine weather, yields averaged more than 600 jin per mu. A 1 mu field at the Farm Science Station of Sanhe Commune produced 825 jin per mu. Taishan County plans to extend its cultivation to 250,000 mu in 1981.

Apart from the early ripening and superior quality of the original "Xinsizhan" variety, properties which have been retained in "Jinla Xinsizhan," its principal trait is a resistence to shattering that is stronger than in the original strain. During the ripening of the late crop in 1978, a 7 to 8 force cold dew wind struck, but the shattering rate for "Jinli Xinsizhan" was only 1.5 percent, while that of "Xinsizhan" was as high as 31.1 percent. "Jinli Xinsizhan" has short sturdy stems that are strongly resistant to lodging. Plant height is between 75 and 85 centimenters, 15 to 20 centimeters shorter than "Xinsizhan." The root system is well developed; growth is vigorous; tillering is strong, leaf color is jade green, plants are compact in shape, leaves are fairly wide and arched during the early stage and upright during the late stage; and during the yellow ripe stage, stems are green and stalks are waxy. The effective panicles number about 180,000 per mu, each panicle containing more than 100 grains. Fruiting rate is greater than 90 percent, and the per thousand weight of grain is about 17 grams. It is suited for growing in a wide variety of fields, including infertile fields and cold low-lying fields.

The main drawbacks of this variety are fairly broad, thin, arched leaves, and resistance to disease and insect pests is not as great as the stock seed. If cold temperatures are encountered during the late stage, leaves are prone to turn yellow and the change in rice quality is quite great. Currently there is still a small amount of segregation, requiring continued selection and improvement.

Cultivation Essentials:

1. Early sowing and early transplanting: "Jinli Xinshizhan" is a classic late crop early maturing variety (as an early crop, it will not form panicles under ordinary conditions), with a growth period of about 132 days. When sown and transplanted early, the vegetative growth period can be suitably lengthened to achieve large panicles with numerous grains. Heading and ripening will also be ahead of time which will avoid early arriving cold dew winds, and get around the drawback of yellowing of leaves during the late stage because of intolerance to low temperatures. Generally it should be sown from mid to late June and transplanted in late July. It should be transplanted no later than Autumn Begins [around 7 August] (at a seedling age of 35 to 40 days) for ripening around 5 November.

2. Properly spaced seeding, growing of sturdy seedlings, and making the most of large panicle heterosis; "Jinli Xinsizhan" grows vigorously during the early stage and is prone to closing the rows prematurely; therefore, it should not be closely planted in large clumps. According to experiences in Taishan County, between 20 and 50 jin per mu should be sown to grow three-forked seedlings. Transplanting should be done in a 6 x 4 cun or 6 x 5 cun pattern with each clump having 3 to 5 seedlings. If too many seedlings are transplanted, rows will close early, lending to diseases and insect pest, and outputs that are not high.

3. Scientific use of fertilizer and water: Representative surveys made by some communes and production brigades in Taishan county show that for fields with yields of more than 500 jin per mu, 12.8 to 16.4 jin per mu, or an average 14.2 jin, or pure nitrogen should be applied. During the early and mid-stage, the approximate proportion of fertilization should be 87:0:13. Nitrate, phosphate, and potash should be properly matched, and during the mid stage, as a rule, no chemical nitrogenous fertilizer should be used.

During the tillering stage, irrigation should be shallow with much airing of the fields. During the mid stage, there should be no excess sunning of the fields so as to avoid damage to the roots leading to physiological dessication. During the booting and heading stage, shallow irrigation should be done. During the yellow ripening stage, fields should be kept moist, and water not withdrawn from them prematurely.

4. Diligent efforts at prevention and control of diseases and insect pests: This variety is susceptible to leaf rollers, rice gall flies, leafhoppers, and bacterial blight. Good preventive work requires emphasis on cultivation and no excessive fertilization with nitrogenous fertilizer during the early stages, control over fading of leaf color during the mid stage, and not having the soil excessively dry in the late stage in order to prevent occurrence of small round sclerotail disease.

(Huang Guizhang [7806 2710 4545], Rice Institute, Guangdong Provincial Academy of Agricultural Sciences, and Seed Section, Taishan County Bureau of Agriculture)

(2) "IR 837 Nuo"

"IR 837 Nuo" was introduced to the Guangdong Provincial Academy of Agricultural Sciences from the International Rice Institute in 1971. In 1975, the Panyu County Institute of Agriculture began test planting and selection of lines. In 1978 it was submitted as a late crop for countywide regional testing and appraisal, and was acknowledged to be a new glutinous rice variety of superior quality and high yields. Transplantation of individual plants as a late crop on 8 mu in 1979 by the Mingjing No 4 Brigade of Hualong Commune in Panyu County brought yields averaging 808 jin per mu. In 1980, the same brigade transplanted 110 mu of it for average yields of 912 jin per mu, 15 mu of which produced yields of 1,095 jin per mu. In the same year, the Farm Science Station of Hualong Commune grew 2.84 mu for yields averaging 991.9 jin per mu, 23.7 jin higher than the yield from late maturing variety, "Erbaiai." The Fusu No 8 Brigade in the sandy field area lacked seedlings, so it got 45 day old seedlings of "IR 837 Nuo" from another brigade. Panicles formed early after transplanting, but from a 5 mu area, yields still averaged 820 jin per mu. In the same year the Panyu County Institute of Agriculture planted 4.2 mu of it in unused rice seedling beds. At a seedling age of 51 days, early panicle formation began. Prompt action resulted in fruiting for per mu yields reaching 907.5 jin per mu. In 1980, Hualong Commune transplanted about 450 mu of this variety for a general yield of about 800 jin per mu. This commune plans to plant 30 percent of its late crop total paddy rice area to "IR 837 Nuo" in 1981.

"IR 837 Nuo" is both temperature sensitive and light sensitive. For planting in central Guangdong, it is suitable only as a late crop. Its growth period totals between 125 and 135 days. It is economical with fertilizer, produces consistently high yields, and is suited to a wide variety of fields. Its glutinous quality is superior; its polished rice is pure white; and its cooked rice is soft. Plants are between 95 to 105 centimeters tall; stems are sturdy; and plant shape is straight up and down. During the early period leaves are bowed and broad; leaf color is jade green; and during the late stage leaves are straight and thick, and attached to stems at a narrow angle. Flowering is fairly concentrated in time, and panicle formation is completed rapidly. Effective panicles number about 180,000 to 200,000 per mu, each panicle containing between 95 and 120 grains. Fruiting rate reaches 95 to 98 percent; per thousand weight of grain is about 27 grams; and grains are long and large. Rice blast and granular sclerotail disease is slight.

The main drawbacks of this variety are moderate susceptibility to bacterial blight, and sheath and culm blight, plus some susceptibility to false smut of rice. During the late stage, resistance to cold is rather weak; there is little flexibility in seedling age; there is still a small amount of segregation, and taste is not as good as that of Dongpu Danuo.

Essentials of Cultivation:

1. Sowing at the right time to grow sturdy medium age seedlings. As a late crop, sowing should be done around the end of June or early July with transplanting being done at the end of July or early to mid August when the seedling age is between 25 and 32 days. Ideally transplanting should be finished by 1 August, and in no case should it be done after Autumn Begins [around 7 August]. Between 60 and 80 jin per mu of seeds should be sown.

2. Adequate application of base fertilizer, and much fertilizer applied in the early phase, restraint exercised in mid period and a final application made in the late stage. Hualong Commune uses 40 jin per mu of acid ammonium carbonate, and 30 jin per mu of calcium superphosphate as base fertilizer. Seven days after transplanting, it applies 8 jin per mu of urea, and after seedlings are growing well, it applies enough to keep the leaves from yellowing. During the mid season, it applies no chemical nitrogenous fertilizer (for fields lacking in potash, between 15 and 20 jin per mu of potassium chloride may be applied). During the late period, a suitable amount of supplemental panicle fertilizer is applied at the rate of 8 to 10 jin per mu of urea.

3. Transplanting specifications: Generally a 7 x 4 cun of 6 x 5 cun plot is used, each clump transplanted containing 3 to 5 seedlings.

4. Sensible irrigation and drainage. During the early stage, shallow irrigation is most important; during the mid stage, there should be proper airing and sunning of the fields, the sunning not being overdone; during the late stage, water should not be withdrawn prematurely.

Additionally, good work must be done in the prevention and control of diseases and insect pests. During mid-season, sheath and culm blight and bacterial blight outbreaks are to be guarded against. Attention should be given to elimination of rogues to preserve purity in order to assure fine quality glutinous rice.

(Huang Guizhang [7806 2710 4545], Rice Institute, Guangdong Provincial Academy of Agricultural Sciences, and Hualong Commune Farm Science Station, Panyu County).

(3) "Tuanhuangzhan"

"Tuanhuangzhan" is the progeny of a test cross by Bobai County Institute of Agriculture using a "Nanguangzhan" sterile plant and "Tuanjie No 1," which in 1974 was again recrossed with "Huangkeyouzhan" and after six generations bred in 1977 as a stable early crop superior quality paddy variety (as an early crop it has been designated a first grade paddy; as a late crop, it has been designated as a special second grade paddy). Planted throughout the country in 1979 and 1980, fine harvests were universally obtained from it with yields of from 600 to 800 jin per mu and as high as more than 1000 mu. Planted as an early crop in 1979 by the Sizin Brigade of Chengxiang Commune on 23.4 mu, it yielded an average 1100.8 jin per mu. Planted on 385 mu as an early crop in 1980 by Naxiu Brigade of Santan Commune, it produced yields averaging 914 jin per mu; planted as a late crop on 326 mu, yields averaged 806 jin per mu. In 1980, Yulin Prefecture planted about

200,000 mu of "Tuanhuangzhan," and Sichuan, Guizhou, Fujian, Hunan, and Guangdong Provinces also introduced it for test planting.

1. Characteristics: Plant height is from 80-85 centimeters; leaves are tiny; the daosanye [0227 0005 0673] are short, straight, and thick; and the clay leaves are 20 to 28 centimeters long and 1.1-1.4 centimeters wide. The flag leaves are inclined less than 21 degrees. It is a numerous panicle type, high yield fields producing between 320,000 and 370,000 effective panicles per mu, each panicle containing between 77 and 100 grains. The grains of paddy are thin and long, and tan in color. Polished rice quality is good, being not mealy or only very slightly so.

2. Traits: A temperature sensitive variety for which the growth period for early crops is about 130 days, and the sitting autumn [fan qiu 5064 4428] growth period for late crop is about 110 days. Tillering strength is particularly strong. During the early season it appears short, but after jointing it rapidly elongates. It is tolerant of fertilizer and resistant to lodging. Panicle formation is even, and late season ripening color is good. It does not die back prematurely, and when ripe, stems remain green and stalks waxy. It has an 85-90 percent fruiting rate, and a per thousand grain weight of 19.5-20 grams. It is strongly resistant to blast of rice and bacterial blight, but is susceptible to sheath and culm blight. Tolerance of cold in the seedling stage is poor.

3. Cultivation essentials:

(1) On-time sowing to exploit advantages and avoid disadvantages. Given the climate of Bobai County, as an early crop, this variety is generally sown in early March for a seedling age of 30 to 35 days. In this way seedling rot can be reduced, and flowering in the season of the plum rains of early June, when there is little sunshine, can be avoided. Panicles will not form and flowering takes place until mid June; thus the fruiting rate and the per thousand weight of grains being increased for greater per unit yields.

(2) Cultivation for sturdy tillers. Four things must be given particular attention: 1) Light seeding, between 35 and 40 jin per mu being sown for the early crop, or 7 or 8 jin per mu of main fields being used. For the late crop, between 30 and 35 jin per mu should be sown, i.e., 5 to 6 jin per mu of main fields. 2) Application of sufficient base fertilizer with application of fertilizer equivalent to 3000 jin per mu of green manure; 3) timely application of fertilizer to perk up the plants after transplanting, allowing 30 to 40 dan of nightsoil per mu; 4) heavy fertilization of three-leaf fertilizer to promote tillering, using 15 to 20 jin per mu of urea or fertilizer equivalent to between 7 and 9 jin of pure nitrogen.

(3) Sensibly close planting of small plants. Tillering of "Tuanhuangzhan" is particularly strong, so large clumps of seedlings should not be transplanted. On the basis of experience in Bobai County, between 28,000 and 30,000 clumps per mu should be transplanted, i.e., about 100,000 seedlings (each clump transplanted having seedlings from 2 or 3 grains of paddy.) Where fertility and water conditions permit, a 6 x 3.5 cun pattern may be used. Usually a 6 x 3 cun pattern is used.

(4) Scientific fertilizing, to promote growth in the early season, to stabilize it in mid-season, and to supplement it in the late season. Early season fertilization (including base fertilizer) should be ample and applied early. Early period fertilization given to early crop rice that yielded 900 to 1,000 jin per mu was: base fertilizer of 50 jin of ammonium carbonate and 50 jin of phosphate fertilizer per mu, plus 15 to 18 jin per mu of urea applied between 4 and 6 days after transplanting, and 10 to 12 jin per mu of urea and 15 to 20 jin of potash fertilizer per mu applied 8 to 12 days after transplanting. In applying fertilizer for panicle differentiation, the rule to be mastered is "Don't fertilize until redness becomes visible; no redness, no fertilization; much redness, more fertilization; slight redness, less fertilization." Panicle fertilizer and fertilization upon completion of heading should generally be 5 to 7 jin per mu of urea.

(5) Scientific use of water to nourish roots and maintain leaves. Paddy fields should never be heavily sunned no matter whether mid-season or late season. They should only be lightly sunned or sunned to a moderate degree. Alternatively, much airing of the fields may be done so as to nurture the roots and maintain the leaves.

(6) Timely prevention and control of diseases and insect pests. Special attention should be given varieties that are prone to sheath and culm blight and infestations of leaf hoppers. Between the time of transplanting and differentiation of the young panicles, they may be sprayed twice with daojiaoqing [4470 5183 7230], using between 2.5 and 3 liang of pesticide each time. For control of leaf hoppers, usually pesticide is applied once during the early booting stage with a second application being given during the grain formation stage, and another during the time of full heading.

(Liang Kepin [2733 0668 0756], Bobai County Bureau of Agriculture, Guangxi-Zhuang Autonomous Region)

9432
CSO: 4007/456

ARTIFICIAL SHRIMP HATCHING REPORTEDLY UNDERWAY

Guangzhou NANFANG RIBAO in Chinese 6 Jun 81 p 1

[Article by Yu Wei [7411 1218] and Nong Ji [6573 6068]: "Guangdong Province Has Set Up Four Artificial Shrimp Hatching Bases To Raise 6000 Mu of Rare Shrimp This Year"]

[Text] Four artificial shrimp hatching bases have been set up in Zhanjiang Municipality, and in Taishan, Yangjiang, and Haifeng counties under the joint administration of the National Aquatic Products Administration and the Provincial Aquatic Products Department. They have aroused the masses and organized specialized teams to combine intensive and extensive hatching, hatching rare Mergui shrimp, Japanese shrimp, and panaeus japonicus.

Last year all bases both carried out construction and went into production at the same time. Water surfaces in use for artificial raising of shrimp amounted to more than 1000 mu, providing 26.8 tons of fresh shrimp for state export alone. This year 6000 mu of shrimp will be intensively grown, and output requirements are 160 tons. As of mid-May, the Zhanjiang, Taishan, and Yangjiang bases alone had already provided almost 50 tons of fresh shrimp to the state for export.

Shrimp have large bodies and lots of flesh. They contain abundant nutrition and have a delicious taste. They are a rare food of which people are fond. The foreign exchange return on their export is high. Use of sea water to raise shrimp permits rapid turnover, quick results, and benefits accruing in the year that the raising is done. Bays in Guangdong Province suitable for the raising of shrimp are fairly numerous, and two crops a year may be raised. Last year the National Aquatic Products Administration formally decided to build four artificial shrimp hatching bases in Guangdong Province, allocated special funds to establish a state hatchery at each base, and provided feed for artificial intensive breeding demonstrations. Communes and brigades at each base have a lot of enthusiasm and, with the help of the state, they have hurried to change over from the old fish and salt to organize special teams for large area raising of shrimp. Now the four bases have already constructed more than 300 cubic meters of ponds for the artificial hatching of larvae. As of mid-May, more than 50 million shrimp larvae had been artificially hatched to stock 5000 mu of water surface.

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GUANGDONG

BRIEFS

PRIZES FOR SAVINGS--The Guangdong Province branches of both the Chinese Bank of Agriculture and the Chinese People's Bank began in May the separate issuance of savings coupons in rural villages, and in cities and towns. End of May statistics show issuance during the first quarter of savings coupons for a total of more than 30 million yuan by the Bank of Agriculture in 10 counties of the province and by main sub-branches in Foshan Prefecture. Qingyuan County was the first place where savings coupons were issued by the Bank of Agriculture. Places where savings have been fairly widespread and amount of savings fairly large have been the overseas Chinese villages in Zhongshan, Taishan, Kaiping, Xinhui, Enping, and Chaoan counties. Other places where savings coupons have been issued are Fengshun, Xingning, and Yingde counties. In most places, drawings of first quarter savings coupons have already been held. There were two first prizes of 500 yuan and of 1000 yuan, as well as a second and a third prize. All holders of savings coupons will receive return of their capital in half a year of 1 year. [Text] [Guangzhou NANFANG RIBAO in Chinese 11 Jun 81 p 1] 9432

CSO: 4007/462

BRIEFS

ALL-TIME RECORD RAPESEED HARVEST PREDICTED--Rapeseed is now ripening from the south to the north in Guizhou Province, and a bumper harvest has become a certainty. Output is forecast to greatly exceed last year's all time high, and quantity procured will increase 63 percent over last year. Commune members in the far flung rural villages began harvesting in mid-April, the season having come relatively early. In Guanling County, the rapeseed has already begun to be moved to granaries. In order to do a good job this year in rapeseed procurement work, the Guizhou People's Government convened a meeting calling upon units concerned to put into effect four no-changes in their procurement work, namely, fixed and unchanging base procurement figures, no change in reward sales to producers for overfulfillment of quotas, unified procurement with no change in prices paid for excess procurement, and no change in divisions [of profits] between prefectures and counties. Right now, grain and oil units everywhere in the province are stepping up preparatory work for procurement. [Text] [Beijing ZHONGGUO CAIMAO BAO [CHINA FINANCE AND TRADE JOURNAL] in Chinese 12 May 81 p 1] 9432

CSO: 4007/464

NEW LEANER HYBRID HOG BRED

Beijing BEIJING RIBAO in Chinese 10 Jun 81 p 1

[Article: "New Hog Variety That Produces Much Lean Meat Bred After 7 Years of Effort by the Municipal Domestic Livestock Institute and the Hog-Raising Farm of the Changping Supply and Marketing Commune; This Hog, Which Is Called 'Duchangbei,' Also Characterized by Strong Disease Resistance, Rapid Weight Gain, and Economy in Use of Feed"]

> [Text] Editor's Note: One fundamental way to solve the problem of "difficulty in buying lean pork" is to develop a lean meat type of hog. Experiments with the "Duchangbei" show that development of a lean meat hog can increase the supply of lean pork in the market, can provide marketing opportunities for hog raising by peasants, and can reduce state losses. It is hoped that units concerned will place this matter on their agendas, formulate plans, readjust policies, and take action to gradually have lean meat type hogs replace the present meat and fat type hogs in the suburbs.

Good news has appeared in the midst of a current situation in which city and country people are more and more concerned with greater output of lean pork. Following 7 years of experiments with various kinds of hybrid combinations by the Domestic Livestock Institute of the Municipal Academy of Agricultural Sciences working jointly with the Hog-Raising Farm of the Changping County Supply and Marketing Commune, a hybrid lean pork type hog combining the three elements of high lean meat yield, good fattening characteristics, and large economic benefits has been bred--"Duchangbei." This has layed a good foundation for development by this city of lean pork type hog production that is suited to the needs of the people in the city and the countryside.

Between 1974 and 1980, the Domestic Livestock Institute of the Municipal Academy of Agricultural Sciences and the Hog-Raising Farm of the Changping Supply and Marketing Commune have conducted numerous comparative binary and ternary comparative experiments using both more than 20 hog varieties imported from abroad and Beijing black hogs. They bred primary hogs with primary hogs, primary hogs and varieties of hogs that had been bred, and varieties of hogs that had been bred and high yield hog varieties. Time after time they selected the superior and eliminated the inferior, breeding binary combinations with fairly good heteroses, "Changbei," "Fubei," and "Neibei." During 1979 and 1980, they crossed the famous lean meat type hogs, dulouke [2629 3157 0344] [phonetic], dabai [great white] hogs, and changbai [long white] hogs with these binary hybrid hogs to make 28 ternary hybrid combinations. After 39 fattening experiments, they finally decided the overall standards of "Duchangbei" were best.

This ternary hybrid, "Duchangbei" was produced from a first generation hybrid sow using a Beijing black hog as the female parent and a changbai hog. This sow was then crossed with a second dulouke male parent to produce the "Duchangbei." Thus, in this hybrid hog are concentrated the superior characteristics of three species of hogs to make use of good qualities while avoiding bad ones. It possesses the superior characteristics of the Beijing black hog of strong disease resistance, which suits it to feeding conditions in the Beijing suburbs, and it possesses the superior characteristics of the duluoke and changbai hogs in being economical in use of feed, gaining weight fast, having a high lean pork rate, and steady growth. Circumstances ofcomparative experiments between the "Duchangbei" trenary hybrid lean pork type hog and the Beijing black combination pork and fat type hog currently being raised in the suburbs were as follows: During the course of raising the hogs from a weight of 24 kilograms to 90 kilograms during the same year and under identical feeding conditions, the "Duchangbei had an average daily weight increase of 676 grams, 60 grams more than the Beijing black. For each additional 1 kilogram of live weight gain, 3.34 kilograms of mixed feed was consumed, a 0.63 kilogram saving as compared with the Beijing black. The lean meat rate from the carcass was 54.5 percent, 10 percent higher than for the Beijing black. The experiments showed the "Duchangbei" superior to the Changbai hog as well. Feeding conditions and feeding requirements for the "Duchangbei" hybrid hogs are virtually the same as for the raising of the Beijing blacks; consequently they will be easily promoted and popularized. Last year, the hog-raising farm of the Changping County Supply and Marketing Commune sold 800 head of lean pork type fattened hybrid hogs.

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HEBEI

WEI COUNTY WASTELAND PUT INTO PRODUCTION

Beijing RENMIN RIBAO in Chinese 19 Jun 81 p 1

[Article: "Wei County Brings 20,000 Mu of Wasteland Under Cultivation; Following Institution of System of Responsibility for Production, Commune Members Treasure Land Like Gold"]

[Text] Following institution of a system of responsibility for production in the rural villages of Wei County in Hebei Province, the cultivated land area has been increased by more than 20,000 mu. Long abandoned cogongrass land and scattered plots of land have sprouted beautiful crops.

Full use of barren land and scattered plots has increased the income of the collective and of commune members. Last year, this kind of land throughout the county produced more than 1 million jin of grain, 31,000 jin of cotton, 13,000 jin of peanuts, and 172,000 jin of pulses and sesame seeds. Additionally 1.7 million trees were planted on it. F-ngding Commune in this county has 850 mu of cogongrass land, which was divided among commune members in 1979 when it produced 150 jin per mu of millet. Last year the harvest reached 300 jin per mu, and a total of more than 382,000 jin of grain was harvested. Yuanxi Production Brigade in Yuanbao Commune apportioned more than 200 mu of sandy wasteland north of the village to commune members. Yields now average 350 jin per mu of peanuts. This item alone has increased average per capita earnings of the brigade by 33 yuan. Commune member Xie Zhongyi [6200 0022 5030] with a family of five had long been a hardship household. Last year he grew 2.5 mu of peanuts on wasteland he had brought under cultivation, harvesting a yield of 520 jin per mu and earning 780 yuan. When other earnings were added to this, his household suddenly changed from a hardship household to a wealthy household.

For a long time, under the guidance of a "leftist" mentality, many river flat wastelands and arable land around the rural villages in Wei County lay unused. Following institution of a system of responsibility for production, commune member ardor for production surged, and they treasured land like gold. Not only the neglected "airports" and "tractor stations" (This is commune member language meaning land with a large number of missing plants or land that is severely cracked) in good fields, but numerous wastelands and scattered plots, as well, were brought under cultivation and put to use. Production teams in such places usually apportioned land to commune members on the bases of the number of people in their family, instituting overall contracting to work the land, commune members harvesting for themselves whatever they had plowed and planted by themselves, the production teams requiring only a fixed amount of goods or cash. Some other production teams required nothing whatsoever from commune members for the first 3 years. Still other production teams planted trees in such places, alloting them to commune members to take care of, income from the trees being proportionately divided once the trees had become mature. When the young trees were growing, commune members could plant grain or economic crops in the groves, the earnings therefrom going to the commune members. As a result of the clear-cut policy, the enthusiasm of the broad masses of commune members for bringing wasteland and scattered plots of land under cultivation and using them is very high, and they carefully plow, plant, and tend them. The entire family of many commune members joined in digging up cogongrass, digging down to a depth of 1 chi or more. In order to prevent chickens from scratching or dogs from rooting in scattered plots near villages, some erected enclosing walls or fences.

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BRIEFS

FARM OUTPUT IN BEIJING SUBURBS--Since liberation, farm production in Beijing suburbs rose as follows: 1) grain from 834,100,000 jin in 1949 to 3,719,989,000 jin in 1980, an increase of 3.46 times; 2) vegetables from 210,770,000 jin in 1949 to 3,518,580,000 jin in 1980, an increase of 15.7 times; 3) milk from 7,640,000 jin in 1952 to 136,000,000 jin in 1980, an increase of 16.8 times; 4) fresh eggs from 3,520,000 jin in 1949 to 48,410,000 jin in 1980, an increase of 12.8 times; 5) fish from 570,000 jin in 1957 to 8,074,000 jin in 1980, an increase of 13.2 times; 6) pork, beef and lamb from 5,650,000 jin in 1949 to 260,616,000 jin in 1980, an increase of 45 times; 7) dried and fresh fruits from 86,660,000 jin in 1952 to 318,280,000 jin in 1980, an increase of 2.67 times. [Beijing BEIJING RIBAO in Chinese 27 Jun 81 p 2]

CSO: 4007/513

BRIEFS

AFFORESTATION UPDATE--Heilongjiang Province has actively developed state-operated afforestation, principally through reliance on commune and brigade collective afforestation efforts, and has encouraged individual commune members in a program of planting of trees for afforestation, using a policy of "ownership to those who afforest." This has brought about a brand new situation in state, collective, and individual participation in forestry. This spring 3.64 million mu was afforested for various purposes such as lumber forests, shelter forests, firewood forests, economic forests, and environmental beautification forests in a 104 percent fulfillment of the annual plan, for a 15.6 percent increase over the same period last year. This was an accomplishment rarely made in the building of forestry in Heilongjiang Province since the founding of the Chinese People's Republic. [Text] [Beijing RENMIN RIBAO in Chinese 30 Jun 81 p 4] 9432

ECONOMIC DEVELOPMENT--Harbin, 12 Jun (XINHUA)--While developing the economy under the system of ownership by the whole people, Heilongjiang Province's state-run farms are actively developing a collective economy and family sideline occupations. These farms have set up 1,100 production teams, workshops, squads and groups, with a total of over 93,000 staff members and workers engaged in planting, sowing, raising animals and aquatic products, collecting, processing and weaving work, as well as other productive occupations. The total number of such staff members and workers accounts for 13.3 percent of that under the system of ownership by the whole people, and the acreage of arable land they manage is 470,000 mu, accounting for 1.5 percent of the total land reclamation area. The total income from the collective economy and family sideline production in 1980 was 180 million yuan, or 7 percent of that from the whole area. The number of hogs raised by families was 230,000, and the number of pigs sold to the state was 80,000, accounting for 40 percent of those sold in the whole land reclamation area. [Beijing Xinhua Domestic Service in Chinese 0156 GMT 12 Jun 81]

CSO: 4007/512

BRIEFS

LAKES STOCKED WITH CRABS--Sixty large and medium-sized lakes in 23 counties throughout Hubei were recently stocked with a total of more than 600 million young crabs imported from Shanghai, Jiangsu, and other areas of China. This was 1.2 times the number imported into Hubei last year. [Wuhan HUBEI RIBAO in Chinese 18 Jun 81 p 1]

MORE CULTURED PEARL FARMS ESTABLISHED--The number of cultured pearl farms in Hubei has been increased to more than 500, raising over 2 million river clams to grow pearls. As most of these farms are run by communes and production brigades, some 3,000 commune members have been trained in pearl cultivation techniques. [Wuhan HUBEI RIBAO in Chinese 12 Jun 81 p 1]

CSO: 4007/513

ADVANTAGES OF RURAL ENERGY CONSERVATION STRESSED

Nanjing XINHUA RIBAO in Chinese 11 May 81 p 1

[Article by "Staff Commentator": "Rural Energy Conservation Has Great Potential"]

[Text] Energy conservation is a pressing current task and a long-term strategic task. Electricity and petroleum products are important strategic commodities of the country, and effective conservation of electricity and petroleum are an important aspect of implementing the policy of readjustment. Rural use of electricity and petroleum is spread over a wide area and is large in scale, and there is immense potential for conservation. The masses of rural cadres and commune members should strive to conserve these energy sources and to achieve optimum economic results with the least energy consumption.

Conservation of rural electricity and petroleum first requires that it be taken seriously by leadership at all levels. As the rural collective economy has expanded and matured, the number of agricultural machines in this province has increased greatly in recent years, with the total motive power already amounting to 15.15 million horsepower, including more than 11 million HP in internal combustion engines. The diesel fuel consumed each year amounts to 60 percent of the total quantity supplied on the market provincewide. In 1980 rural electricity use increased to 3.5 billion kWh, about a tenth of the total rural energy use nationwide. In the last 2 years, as a result of joint efforts by the electrical and petroleum supply and agricultural machinery management departments and the broad masses of rural cadres and commune members, considerable achievements have been made in conservation of electricity and petroleum, but the supply shortfall and the potential for conservation are still great. Leadership personnel at all levels must be thoroughly aware of this circumstance and must not one-sidedly concern themselves with output figures without considering costs and energy consumption.

There is great potential for electricity and petroleum conservation in the countryside. This province's standard for average energy consumption per mu in tractor operation has already been decreased from the 1978 figure of over 1 kg to a 1980 figure of 0.83 kg, but it still exceeds the national standard by 10 percent. Consumption of diesel oil and engine oil in agricultural drainage, irrigation and other activities is still too high everywhere, and there are grave cases of waste. The amount of electrical power wasted provincewide is also quite shocking. Wasted power accounts for about 10 percent of total rural power consumption every year, more than 300 million kilowatt-hours, or a loss of about 21 million yuan. If this electrical power were used in industrial production it could increase output value by more than 900 million yuan. How can we turn a blind eye to such great waste of so precious an energy resource?

The main cause of rural energy waste is lax management, extensive inefficient energy consumption, poor operating condition of power lines and rural agricultural equipment, and serious losses and leakage of electricity and petroleum products. Some low voltage power lines built, maintained and used by communes have many obstacles along their paths, and the insulation has deteriorated, so that wire with broken insulation rubs against tree branches and bamboos and large amounts of electricity runs down through them into the ground and is lost. Some communes' tractors have serious oil leaks so that they "leave a trail when moving and a puddle when standing." Accordingly we must conscientiously intensify our management and take a multisided approach to energy and petroleum products conservation. Petroleum products should be subject to a centralized quantitative planned supply. Brigades and production teams must set up a petroleum products management system and see to it that the products are used in planned fashion, that all products are accounted for, and that procedures are followed when products are received or dispensed, and that there are standard unit consumption figures. In particular, management of agricultural machinery should be intensified and an energetic effort made to improve the operating condition of the equipment. The escalating agricultural equipment and electrical irrigation and drainage system care and maintenance competition centered on the "three leak preventions, four cleans and one good condition" and regular comparison and assessment should be combined with unscheduled spot checks to encourage the development of continual care and maintenance. In combination with awards for the "five fixed" in agricultural production and with individual machine accounting, petroleum use quota commitments and awards proportional to conservation should be instituted and inefficient fuel consumption resolutely reduced. In rural electrical consumption, economic operational management and consumption management should be intensified and communes and brigades using electricity should be mobilized to self-reliantly repair substandard power lines, lighting lines and residential wiring. Electricity for drainage and irrigation is an important part of rural electricity consumption, and an effective effort must be made to assure that full sets of pumps are available, that the ditch system is fully usable, and that a system of scientific water use and water conservation are instituted and kept in good order so as to save water and electricity and decrease agricultural costs.

Vigorously popularizing innovations in electrical and petroleum products conservation is an important task in decreasing their consumption. Innovations which can overcome certain glaring types of energy waste through simple technical improvements should be actively promoted. Mass activity related to electricity-saving and petroleum-saving technical innovations should be actively supported and innovations which have been favorably assessed should be put into extensive use.

While making a conscientious effort in rural energy conservation, we must also make a success of agricultural energy-related construction, vigorously develop methane production and thoroughly utilize wind power, biological power and solar power. If we are effective in both opening up new sources and in conservation, the problem of rural energy shortages can be rather well solved.

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CSO: 4007/428

ADVANTAGES OF PLAINS AFFORESTATION GENERALLY SURVEYED

Beijing RENMIN RIBAO in Chinese 23 May 81 p 2

[Article by Yang Jue [2799 3778]: "Numerous Advantages From Afforestation of Plains--A Survey of Jiangsu Plain Afforestation Work"]

[Excerpts] Recently I went with several comrades from the Ministry of Forestry and the Jiangsu Provincial Bureau of Forestry to Fengxian, Pixian, Xinjin, Suqian, Siyang, Jiangdou, Hanjiang, and Liuhe counties as well as to the Nanjing Forestry Products Industrial Academy and the Provincial Institute of Forestry to conduct a survey of the situation, of problems, and of experiences in developing forestry in plains areas.

The Jiangsu Plain amounts to 69 percent of the total area of the province. The province's present forest reserves amount to about 15 million cubic meters, and forest resources of the plain amount to 12 million cubic meters, so the plain accounts for 75 percent of the forest resources of the entire province. In Xuzhou Prefecture, farmlands where forest networks can be built amount to 10.7 million mu. The more than 7 million mu of forest network that has already been built has provided striking benefits. Ever since 1974, Fengxian in Huangfa Prefecture has given attention to afforestation of the entire county as part of the capital construction of its farmlands, and has won striking benefits within a period of 6 or 7 years. The present area of afforested preserves in the county amounts to 95,000 mu; about 25 million trees have been planted in the four besides [beside houses, villages, roads, and water]; more than 900,000 mu of farmland forest networks have been built; and tung trees have been intercropped with farm crops on 150,000 mu. Development of forestry has brought about definite changes in the structure of agriculture, forests, and animal husbandry in the county.

After Fengxian made initial installation of water conservation equipment and started on farmland forest networks, grain output throughout the county, which had long fluctuated at the somewhat more than 300 million jin level, developed to the average 9 percent annual incremental increases of the past several years, and total putput for 1980 was 68 percent higher than in 1974. At the same time trees provided abundant fodder for development of the livestock industry. Fengxian has more than 440,000 head of mountain sheep, each household raising an average of 2.6 head. In all communes and brigades where agriculture and forestry is developing rapidly, animal husbandry is also developing rapidly.

In addition to providing rural villages with fodder to raise sheep and rabbits, development of forestry has also provided them fuel, fertilizer, and raw materials for sideline occupation processing. In Fenxian, tree branches can solve the fuel problem of commune members for 3 months. In front of and behind every house can be found tree branches that have been pruned. In Xuzhou Prefecture, use of tree branches as fuel has permitted return to the fields of 1 billion jin of plant stalks to help solve problems in fertilizer for the farmland. Eighty million of China's rural peasant households (more than 47 percent of the total number of rural households in the country) lack firewood from 3 to 6 months annually. In the provinces of Henan, Shandong, Hebei, Jiangsu, and Anhui, the shortage of firewood in numerous communes and brigades is pronounced, and every year communes and brigades have to devote more than 20 percent of their able-bodied workforce to collecting firewood and hauling coal from mountains. Planting of trees to create forces and solve the fuel problem both effects savings in the province's workforce and financial resources, and saves the province's coal.

Tree leaves also make very good fertilizer. A 6 to 10 year old paulownia tree can annually provide about 2,000 jin of fresh leaves, the nitrogen content of which is equal to that of 28 kilograms of beancake. At the rate of four such trees per mu, the nitrogen content of the paulownia leaves produced is equal to 112 jin of beancake.

Development of bamboo also provides raw materials for rural village sideline occupation processing.

It should be also pointed out that that afforestation of the plain is a major measure for assuring increased agricultural output. The broad plains areas and farming areas of China from south to north annually sustain calamitous dry hot wind attacks to one degree or another, and it is summer crops that first bear their brunt. However, places that have been well afforested reduce this natural calamity. Relevant data show that afforestation of plains to form shelter forest systems can reduce wind velocity by 30 percent. Air humidity also increases by more than 10 percent, and soil evaporation declines by more than 30 percent to regulate the macroclimate, and reduce the degree of damage to farm crops.

Afforestation of the plain is also a major measure for improving the pattern of timber production, and changing the situation of "southward hauling of northern timber." In southern river network regions, in north China, and in the central plains, the state must annually bring in from timber growing areas 11 million cubic meters of timber. China has 663 plains counties where if full advantage were to be made of soil fertility, good water resources, convenient transportation, a large workforce, and rapid tree growth, within 10 years results would be visible.

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CSO: 4007/450

BRIEFS

YANCHENG PREFECTURE SUMMER CROPS--Yancheng Prefecture has increased the output of summer crops this year. The total output of summer grain crops and of rapeseed increased respectively by more than 20 million jin and by 50 percent compared with the same period in 1980. [Nanjing Jiangsu Provincial Service in Mandarin 1100 GMT 7 Jul 81]

BINHAI COUNTY SUMMER CROPS--Binhai County, Jiangsu, harvested 170 million jin of summer crops this year. [Nanjing Jiangsu Provincial Service in Mandarin 1100 GMT 11 Jul 81]

PROVINCIAL RAPESEED PROCUREMENT--According to the Jiangsu Provincial Food Department, the province this year has so far overfulfilled the task of procuring rapeseed by 3.7 percent. Currently rapeseed put up in storage is 130 million jin more than in the same period last year, registering the best record in history. [Nanjing Jiangsu Provincial Service in Mandarin 1100 GMT 23 Jun 81]

CSO: 4007/512

SHANDONG

SPRING SOWING REPORTED COMPLETED DESPITE DROUGHT CONDITIONS

Jinan DAZHONG RIBAO in Chinese 2 Jun 81 p 1

[Article: "Spring Sowing Tasks Victoriously Completed in Shandong Province"]

[Text] The broad masses of rural cadres and people in Shandong Province have fought drought to victoriously complete spring sowing on more than 40 million mu of fields. Quality of sowing has been rather good everywhere.

This spring Shandong Province experienced a drought of rare intensity. Between November last yearand April this year, only between 30 and 40 millimeters of rain fell, 60 percent less than for the same period most years. During March and April, in particular, average daily temperatures tended to be 1 or 2 degrees warmer than in most years; winds were more frequent and stronger, and evaporation of moisture from the soil was rapid. This plus the drying up of surface water and a drop in the underground water table seriously impaired sowing of spring crops. In order to insure completion on time of spring sowing tasks and to lay a good foundation for a bumper harvest in agriculture, all jurisdictions adopted active measures to centralize leadership and concentrate workforces to make fullest use of water resources and equipment for an assault on the drought to plant seeds. Seventy percent of the province's crops have been sown by watering and dibbling of the seeds. Between 7 and 8 million mu was irrigated before spring sowing to provide soil moisture, adding substantially sufficient moisture for planting of seeds. In the combat against drought to do spring planting, all jurisdictions diligently put into effect various rural village economic policies, promoted various forms of a system of responsibility for production, and took full advantage of both collective and individual commune member initiative.

By way of strengthening leadership in the fight against drought, both the Provincial CCP Committee and the Provincial Government several times convened special conferences to study the fight against drought, and sent out work teams to 39 counties in 13 prefectures and municipalities to help fight drought. Prefectures, counties, and communes transferred more than 80,000 cadres to the grassroots level to work with commune members in fighting drought. Banks, industry and transportation, farm machine and commercial supply and marketing departments provided very great financialand material help. Units of the People's Liberation Army stationed everywhere in Shandong sent out large numbers of combat commanders to help communes and brigades near where they were stationed to fight the drought in a "double assurance," making a contribution to winning victory in the fight against drought, and doing spring sowing.

Now all locales have turned to caring for the fields. The broad masses of cadres and commune members are determined to carry forward the spirit of arduous struggle, to fight drought and do watering, to tend the spring fields, and to assure full stands and vigorous growth of seedlings. The province has already checked and replaced more than 17 million mu of seedlings (reseeding as necessary), has hoed more than 16 million mu, and has watered 5 million mu, all more speedily than during the same period last year.

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SHANDONG

MORE DIVERSIFICATION, LARGER PRIVATE PLOTS CALLED FOR

Jinan DAZHONG RIBAO in Chinese 1 Jun 81 p 1

[Article: "Application of the Zeal Used in Capital Construction of Farmland to Diversification is the Call of the Prefecture and Municipal CCP Committee Secretaries Conference Recently Convened by the Provincial CCP Committee"]

[Text] Liberate the mentality, penetratingly examine, and make the most of advantages. Apply to diversification the zeal used in capital construction of farmland. These are strategic tasks posed at the Prfecture and Municipal CCP Committee Secretaries Conference recently convened by the Provincial CCP Committee.

As a result of discussion among comrades in charge of CCP committees in prefectures and municipalities who attended this conference, it was acknowledged that Shandong Province has made achievements over the past several years in its attention to grain production. The 73 million people in the province have achieved self-sufficiency in grain with a surplus, and last year's cotton and peanut output again showed great increases in the beginning of a provincewide change in the internal structure of agriculture. Nevertheless, not enough attention has been given to diversification in forestry, animal husbandry, sideline industries, and fisheries; all-around development of agriculture has not yet been achieved. Consequently, there must be a further emancipation of the mentality, and application of the zeal of the past several years in capital construction of farmlands to diversification.

Everyone acknowledged that a good job of diversification would require solution to the following several problems:

First is a unified conception of diversification. For a long period of time, as a result of the influence of "leftism," the Provincial CCP Committee fastened both eyes solely on the 110 million mu of cultivated land in the province, ignoring use of the 38 million mu of barren mountains, barren beaches, and abandoned barren lands, or the more than 4 million inland water surfaces and the 3,000 kilometer coastline. For the 110 million mu of cultivated land as well, emphasis was on grain production, and diversification was never placed in the position it deserves. Some leadership cadre lack adequate understanding of the significance of developing a socialist commodity economy or else regard a commodity economy as being capitalism, fearing to have anything to do with it and fearing that some commune members may become standouts. Therefore, it is necessary to study the relevant Central

Committee documents and to purge the influence of "leftist" ideology, to correct their understanding of diversification.

Second is doing a good job on planning and crop patterns. Shandong has very good conditions for diversification. Many places are suited to the growing of peanuts, cotton, flue-cured tobacco, and such economic crops. Conditions are also superior for development of aquatic products and hatching. The tortuous coastline is long, and nearly 3 million mu of the 17 million mu of shallow coastal sands and beaches can support hatching; inland water surfaces capable of supporting fish hatching are also quite large. There are number varieties of fresh and dried fruits with high output. Conditions for the planting of trees in afforestation are also fairly good. Barren mountains, barren beaches, hamlets, roadsides, and riversides suitable for forests amount to more than 56 million mu, or about half of the land presently under cultivation. Domesticated animals and fowl resources are abundant, offering broad opportunities for development. Handicraft production possesses traditional techniques and enjoys a broad mass base. All this demonstrates that if only the most is made of advantages, and all out efforts are made to develop diversification, the flourishing of the national economy is bound to be promoted. At the present time, the enthusiasm for diversification is very high at the grass-roots and among the masses. In order to avoid blind action, good jobs of planning and forecasting must be done, as well as further readjustments made in the internal structure of agriculture, and a good job done in the pattern of agriculture, forestry, animal husbandry, sideline industries, and fisheries. We must base ourselves on local resources to open wide production avenues.

Third is solution to problems with economic policies. Attention must now be given to making the most of the enthusiasm of the collective and of individuals. All the fairly large projects suited to collective operation should be run by the collective; and those suited for operation by commune members should, insofar as possible, be done by peasant households, production teams lending organization and assistance. Diversification that is done collectively requires a system of responsibility forproduction. Specialized contracting, and a system of responsibility linking remuneration to output must be vigorously promoted. Various forms of specialized teams, specialized units, specialized households, and specialized workers must be organized. Private plots should be enlarged, being expanded from the present provincial average of a little more than 6 percent to another 10 or 15 percent. In addition to the barren mountains and barren beaches operated by the collective, a suitable portion should be designated for operation by commune members. Plains forest networks and intercropping of tung trees with grain, dates with grain, mulberry trees with grain, and fruit trees with grain should be contracted out to specialized teams, units, households workers or commune members' households together with farmland, with increases in value being divided up.

Fourth is clearing the channels. Emphasis should go to requirements of "three mores and one fewer," (namely, more kinds of economic ingredients to do business in, more channels of flow, more forms of purchasing and marketing, and fewer linds), and strict attention to study and solution of problems in the promotion of procurement contracts for agricultural byproducts, with gradual development from brigade purchase and marketing agencies to brigade operated businesses, as well as individual small retailers and collective trade.

The conference called upon CCP committees and the government at all levels to make diversification a major matter, placing it on their important agenda, and frequently summarizing, examining, and discussing it. Leadership cadres should act personally to organize cadres and technicians to undertake systematic and intensive investigation and study, to give attention to classic examples, to gain experiences, and to improve upon practical guidance. Industry, transportation, finance and trade, and scientific and technical departments should give the green light to development of diversification.

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NEW HIGH YIELD DISEASE RESISTANT COTTON VARIETY REPORTED

Jinan DAZHONG RIBAO in Chinese 17 May 81 p 1

[Article: "Lumian No 1" Takes First National Prize for Invention Following National Science Commission's Invention Appraisal Committee's Examination and Approval"]

[Text] On 9 May, the Invention Appraisal Committee of the National Science Commission examined and approved for issuance of first prize a new cotton variety, "Lumian No 1," bred by Pan Juqin [1690 1446 0530] et al of the Shandong Provincial Institute of Cotton. This was the first national first prize for an invention taken by Shandong Province since the State Council's 1978 re-revision and promulgation of regulations for prizes for inventions.

"Lumian No 1" was bred after 15 years of efforts that combined both the breeding of hybrids and breeding through irradiation. It was prominent in both the 1976-1977 provincial cotton variety regional tests, and in the 1977-1978 national regional tests. It produces consistently high yields, has strong resistances, and is widely adaptable. Ginned cotton yields averaged 146.4 jin and 159.4 jin respectively in the tests, 55.04 and 39.48 percent more than for Daizi No 15. In high yield farming experiments on small areas at the Provincial Academy of Agricultural Sciences experimental farm and at the Provincial Institute of Cotton in 1977, yields of ginned cotton amounted to 271.5 jin and 263.5 jin respectively. One of the main reasons for the bumper cotton harvests in Shandong Province last year, when total output and yields per unit of area increased over the year before last 2.2 and 1.37 times repsectively. was the promotion over wide areas of "Lumian No 1." Statistics from units concerned show "Lumian No 1" was grown over a total area of 8.5 million mu in Shandong Province last year. Figuring average increased yields of 30 jin per mu of ginned cotton (the average increase in experiments with "Lumian No 1" between 1974 and 1978), this would mean a 2.5 million dan increase in output of ginned cotton, equivalent to three-fourths of the province's total cotton output during the year before last, plus an increased harvest of seeds. The total annual increased income would be 550 million yuan, 150 times the total annual state investment in the Provincial Institute of Cotton of 3.64 million yuan.

The wide area promotion of "Lumian No 1" has also broken the longstanding introduction of dominant cotton varieties into the province from elsewhere. Experts concerned have said that since Liberation, China has bred about 200 varieties of cotton, but because they have not been widely adaptable, and since the speed of their spread has not been rapid, only seven of them have been promoted over an area of more than 1 million mu. Varieties planted on more than 5 million mu number only three. The planting in Shandong Province last year of 8.5 million mu of "Lumian No 1," plus its promotion over a 10 million mu area in other provinces is unique in China. In the process of promoting its cultivation, comrades at the Provincial Institute of Cotton not only researched a set of commensurate farming and management techniques for it, but also adopted diverse ways of greatly multiplying the propagation of seeds, whereby "Lumian No 1" went from 1 mu in 1975 to 10 million mu last year for an average propagation coefficient of 30 times in 5 years. Such a rapid propagation coefficient is unheard of.

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BRIEFS

MORE RAIN REPORTED--It rained in Shandong from the evening of June 19 to June 21. By 1600 on June 21, heavy to torrential rainfalls were reported in Dezhou, Huimin, Liaocheng, Heze, Jining, Tai'an and Linyi prefectures. Yangxin County had the heaviest rainfall--a total of 108.4 mm, while light to medium rainfalls were registered in other areas. [Jinan DAZHONG RIBAO in Chinese 22 Jun 81 p 1]

COTTON SEEDLINGS GROWING WELL--Despite severe droughts, the seedlings on the 10 million mu of cotton in Shandong are growing well. This year, most of the seedlings germinated in April and over 70 percent of the cotton fields was full of seedlings. By early June, flower buds began to form on the majority of plants, 4-5 days earlier than in last year. All of the 164,573 accounting units for the cotton growing areas have adopted a responsibility system. [Jinan DAZHONG RIBAO in Chinese 19 Jun 81 p 1]

SUMMER SOWING--Shandong Province has finished its summer sowing on over 50 million mu of farmlands. Peasants in all localities are enhancing field management for spring and summer crops, preparing for waterlogging and floods and accumulating manure. As of 8 July, some 5.9 million mu of farmlands were hoed, and 3.6 million mu of crops were applied with fertilizer. They eliminated insect pests on 1.7 million mu of lands and accumulated 3.3 million cubic meters of manure. [SK132149 Jinan Shandong Provincial Service in Mandarin 2300 GMT 12 Jul 81]

SUMMER GRAIN--As of 10 July, Shandong Province had overfulfilled the 2.8 billion jin summer grain procurement task by 3 million jin. The delivery of grain to warehouses has been done 1 month faster than last year and the quality of grain is also better. [Jinan Shandong Provincial Service in Mandarin 2300 GMT 11 Jul 81]

HUANG COUNTY WHEAT PRODUCTION--Jinan, 12 Jul (XINHUA)--Despite a serious drought, Huang County, Shandong Province, has reaped a bumper harvest of wheat. The yield from the county's 400,000 mu of wheat fields averages 600 jin per mu, showing a 20 percent rise compared with last year's record. The total output of 240 million jin is some 17 million jin more than last year, despite the fact that this year's wheat acreage has been somewhat reduced. Up to the present 80 million jin of wheat have been purchased from the county, nearly double the planned purchase target. [Beijing Xinhua Domestic Service in Chinese 0105 GMT 12 Jul 81]

ZHUCHENG COUNTY'S AGRICULTURAL PROGRESS--Owing to the rapid development of agriculture and a diversified economy, the living standard of the people in Zhucheng County, Shandong Province, has improved. In 1979 the grain output of the county was 833.3 million jin, a 22 percent increase over 1978. The per capita distribution of commune members was 25 yuan more than in 1978. In 1980 the county's grain output increased 9 million jin over 1979, and the per capita distribution of commune members increased from 95.67 yuan in 1979 to 110.6 yuan. In 1981 the county harvested 301.99 million jin of wheat, an 80 million jin increase over 1980; 84 million jin have been delivered to the state this summer. [Jinan Shandong Provincial Service in Mandarin 2300 GMT 12 Jul 81]

CSO: 4020/225

SHANGHAI

FOUR MEANS TO COPE WITH DRY HEAT DAMAGE TO WHEAT, BARLEY CROPS DETAILED

Shanghai KEXUE ZHONGTIAN [SCIENTIFIC FARMING] in Chinese No 5 May 81 p 14

[Article by Huang Shusheng [7806 5002 3932], Jiangsu Provincial Department of Agriculture and Forestry: "Protection Against Hot Dry Winds is Possible"]

[Text] Dry hot winds are a major natural calamity during the late growth stages of wheat, barley and naked barley in Jiangsu Province. Every year between mid to late May and early June, they impair output from wheat, barley and naked barley, reducing annual yields by about 10 percent. In the worst years, they reduce output by more than 30 percent. Consequently, protection against dry, hot winds and insofar as possible, reducing high temperatures and promoting grain ripening is of major significance in winning bumper harvests of wheat, barley, and naked barley.

Investigations show that the degree of damage done by dry, hot winds is closely related to the stage when wheat reaches maturity. When hot dry winds occur between the late part of the milk ripe stage and the dough stage, damage is usually fairly severe. If they occur 10 days prior to the time of full ripening, yields fall by from 10 to 15 percent. If they occur during the mid part of the milk ripe stage, yields generally fall by from 40 to 50 percent. During the early part of the milk ripe stage, plant vitality is fairly strong, and after the wax ripe stage and when coming into milk is virtually complete, damage is light.

To guard against high temperatures and hasten ripening, the first thing to do is to take the measures of "early," "resist," "care," and "prevent." "Early" means readjustment of the crop pattern so that wheat may be sown early, reducing, insofar as possible, the late sowing of wheat. "Resist" means the selection for use of early ripening, bumper yield, strongly resistant varieties. "Care" means the adoption of technical measures to promote early development, early ripening, and appropriately early harvesting. "Prevent" means improvement in the fields' macroclimate by things such as the building of shelter forests. Second is sensible fertilization, guarding against excessive fertilization during the late stages of growth in particular. The greening up and early jointing stages are the key ones for top dressings of fertilizer in the spring season. Fertilization at this time with quick acting fertilizer has remarkable effects on increasing yields. When a fairly good supply of fertilizer is available, it should be applied at different times following the principle of heavy applications during the early stages and light applications in the late ones. After heading takes place, nitrogen absorption by the plants declines, and usually no further fertilization is required. If too much fertilization is done in the late stages, it may cause the plants to remain in the vegetative stage rather than enter the reproductive stage, and ripening will be delayed. This leaves the plants open to damage from dry, hot winds thus causing a drop in yields. Third is fertilization with phosphate and potash fertilizers to promote early ripening. During the jointing and early flowering stages of wheat, barley, and naked barley, a 4 to 6 percent aqueous solution of calcium superphosphate per mu should be sprayed once. This will usually promote early ripening and increase yields by between 5 and 6 percent. In recent years, during the jointing, booting and the initial milk stages, each locale has sprayed 100 jin per mu of a 0.2 to 0.3 percent aqueous solution of potassium dihydrogen-phosphate to reduce damage from hot dry winds. Experiments have shown a general 1 gram increase in the per thousand weight of grain for a 10 percent increase in yields.

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SHANXI

LACK OF SUFFICIENT RESEARCH ON DRYLAND FARMING DECRIED

Taiyuan SHANXI NONGYE KEXUE in Chinese No 4, 20 Apr 81 p 30

[Article by Ren Yinhan [0117 5593 3352], Economic Crops Institute, Provincial Academy of Agricultural Sciences: "Need to Intensify Dryland Agriculture Research Work"]

[Text] Comrade Editor:

Reading of the article titled, "Preliminary Suggestions on Dryland Agriculture" in the issue of "Shanxi Agricultural Science" of the first quarter made a deep impression. Both historically and in terms of long term development, the course of Shanxi's agriculture must be predominantly that of dryland farming. In relevant problem discussion meetings, I have called for support on this, and everyone has acknowledged that the thesis is tenable, but dryland research problems are few, personnel few and far between, the reason being, no dobut, the fairly great difficulties, and difficulties in producing results, so people do not want to do it despite its clear importance. More importantly, leaders at all echelons lack clarity in their guiding mentalities; technical policies are not sensible; and there is no body of methods to lend support and encouragement to scientific research in dryland farming. This state of affairs awaits change.

We formerly engaged in breeding of dryland wheat and in transforming low yields of dryland wheat in mountain areas to moderate yields, but numerous changes have occurred in these endeavors and it is impossible to continue them. Beginning in 1980, this institute's research work has centered on the breeding of new dryland crop varieties, on drought resisting physiology, and on transforming low yields to moderate yields. I am sending for your examination a copy of "Preliminary Exploration of the Relationship Between Dryland Winter Wheat Output and Meteorological Factors."

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BRIEFS

NATIONAL MEETING ON HYBRID GAOLIANG--The third national research coordination conference on the use of gaoliang hybrid heteoses was held between 20 and 25 February 1981 in Taiyuan. Seventy-four delegates from agricultural research, teaching and production units in 11 provinces attended and more than 70 research reports were received. The conference summarized and exchanged experiences on achievements in recent years on gaoliang research, analysed the situation of gaoliang production and research, conducted thoroughgoing discussions of the direction and tasks of future gaoliang research, and formulated three cooperative programs for breeding of gaoliang hybrids, research on specie resources, and cultivation for 1981-1985, as well as trial experimental methods to be used in the field of gaoliang hybrids (or varieties) nationally. Delegates unanimously acknowledged that gaoliang research standards have improved during the past several years, and that basic theoretical research has been particularly strengthened. Following full discussion, the delegates put forward 37 cooperative projects for gaoliang breeding, cultivation and specie resources. They organized 10 key task teams for the breeding of a new sterile line, for multiploid breeding, for the application to variety resources of isozyme techniques, and for gaoliang heat and light reactions. They exchanged views on the content, methods, and procedures of other projects, and formulated programs for carrying them out. The conference stated its determination to breed within a 3 to 5 year period a group of new gaoliang varieties with high yields of good quality in order to change the nature of gaoliang andsatisfy the needs of the people's livelihoods. [Text] [Taiyuan SHANXI NONGYE KEXUE No 4 in Chinese 20 Apr 81 p 1] 9432

CSO: 4007/462

NANCHONG PREFECTURE'S FOUR MAJOR SYSTEMS OF RESPONSIBILITY EXPLAINED

Chengdu SICHUAN RIBAO in Chinese 8 Apr 81 p 1

[Article: "Nanchong Prefecture Establishes and Perfects System of Responsibility for Rice Production"]

[Text] The Nanchong Prefecture CCP Committee has made a thorough investigation and study, and has acted in accordance with the desires of the masses to give enthusiastic help in putting into effect a system whereby the workforce is responsible for output in drylands production teams. It has also set up and perfected a system of responsibility whereby calculation of remuneration is linked to output in paddy rice production, and has adopted diverse methods for solving the problem of competition between wetlands and drylands for labor and fertilizer, arousing the enthusiasm of commune members for rice production, and giving impetus to rice production throughout the entire prefecture.

The rice growing area of Nanchong Prefecture annually accounts for 65 percent of the spring-sown grain area, and grain output there amounts to more than 80 percent of the spring-sown total. This year, the area planted to rice will be expanded from last year's 3.8 million mu to 4.1 million mu. In order to win a bumper harvest of rice and assure increased output of spring-sown grain, the Nanchong Prefecture CCP Committee has diligently analyzed the current rice production situation. This year, the number of drylands production teams in the prefecture that have instituted a system of responsibility for production whereby the workforce is responsible for production has increased from nearly 10,000 to more than 40,000, or more than 50 percent of the total number of production teams in the prefecture. Nevertheless, a substantial portion of production teams have not put in place a system of responsibility for production of paddy rice, and in quite a few places where fixing of output quotas on a team basis has been instituted, problems still exist in "eating out of two pots." Competition between wetlands and drylands for labor and for fertilizer, and conflicts in the farming seasons for the two kinds of crops are pronounced. In places where the workforce is responsible for output, and where output quotas have been fixed on a team basis, various conflicts exist in the propagation of seedlings, use of water, and use of draft animals. Acting to solve these problems, the Prefecture CCP Committee comrades in charge have organized leaders at all echelons to probe the facts and explore ways of solving conflicts. They have personally led work teams to examine communes and brigades where a good job has been done in setting up systems of responsibility for rice production, summarizing the experiences of the masses in solving these conflicts, and giving guidance to the entire prefecture in further implementation and perfection of systems of responsibility for rice production. Now, the following forms of a system of responsibility for paddy rice production have been generally promoted; The first is setting output quotas on a team basis, making the workforce responsible for management of cultivation, and linking the state of the young plants or output to the calculation of remuneration. Second is forming of teams around oxen. Third is five households to form a team in voluntary combination, with suitable matching of households in a team and calculation of remuneration on the basis of output. Third is contracting by specialists for the farming of "stand-out fields," low yield fields, and odd bits and pieces of fields, prizes being offered for overfulfillment of quotas, and penalties levied for underfulfillment. Four is establishment of specialized rice teams for contracting of individual undertakings, prizes or penalties for which will be their sole responsibility. These methods have effectively aroused the initiative of commune members to do a good job of rice production.

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SICHUAN

SYSTEM LINKING PROMOTION OF FARM TECHNIQUES TO OUTPUT PROMOTED

Chengdu SICHUAN RIBAO in Chinese 12 May 81 p 1

[Article: "Institute Systems of Responsibility; Enliven Farm Technique Promotion Work; Hasten Development of Agriculture. Provincial Conference for the Promotion of Farm Techniques Summarizes and Exchanges Experiences in Trial Use of Systems of Responsibility Linking Output to Promotion of Farm Techniques"]

[Excerpts] In order to summarize and exchange experiences on systems of responsibility linking promotion of farming techniques to output, the Provincial Agricultural Office recently convened a conference for the promotion of farming techniques in Chengdu. Provincial CCP Committee secretaries, Yang Wanxuan [2799 5502 6693] and Yang Ruda [2799 3168 1486], and deputy provincial governor, Yang Zhong [2799 6988], attended the conference and made speeches. The conference transmitted the spirit of the national symposium for the promotion of farming techniques, and exchanged experiences on trial use of systems of responsibility linking promotion of farming techniques to output. In Sichuan Province, the signing of contracts linking output to promotion of techniques began last year in Neijiang, Jianyang, and Renshou prefectures on a trial basis, and all "contract production teams" had increases in output. During this year, most prefectures operated experimental sites, and more than 18,300 production teams in 273 communes in 110 counties have instituted systems of responsibility linking promotion of farming techniques to output. The items and scope of contracting have developed from single grain crops to economic crops and diversification. Contracting units include agricultural departments, research departments, and mass organizations, and the forms of linkage to production are also varied.

Currently several kinds of a system of responsibility linking output to the promotion of techniques are in being in Sichuan Province: 1. Farming technique promotion units sign contracts with production teams linking promotion of techniques to output. Income of production teams increases, and the promotion unit receives technique promotion funds in accordance with the contract. 2. Peasant technicians sign guaranteed output contracts with production teams, receiving awards for production in excess of quotas and paying penalties for shortfalls in output. 3. Research units sign technical contracts with production units in which intermediary experiments are linked to output. For example, the Provincial Academy of Agricultural Sciences signed contracts with eight production teams in Guanghan County for the conduct of experiments in high yield farming of hybrid intermediate maturing rice, thereby promoting high yields of intermediate maturing hybrid rice on more than 78,000 mu throughout the county. Now, it is necessary to proceed from this foundation to improvements and constant development for steady exploration and progress in practice.

The conference also discussed trial regulations pertaining to the system of responsibility linking promotion of farm techniques to output. Everyone believes that as a result of this conference further impetus will be given to promotion in Sichuan Province of a system of responsibility in which techniques are linked to output to make this newborn thing develop vigorously and healthily, to closely link a system of responsibility for agricultural production, a system of responsibility in which promotion of techniques is linked to production, and a system of personal cadre responsibility, and to link traditional intensive farming methods with modern agricultural techniques to increase the level of scientific farming and promote development of agricultural production.

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CSO: 4007/454

ALMOST ALL SICHUAN RESERVOIRS REPORTEDLY BEING USED TO RAISE FISH

Chengdu SICHUAN RIBAO in Chinese 17 May 81 p 1

[Article: "Steady Development of Fish Raising Endeavors in Sichuan Province's Reservoirs"]

[Text] Water conservancy management units at all levels throughout the province have strengthened leadership over the raising of fish in reservoirs for steady new development of efforts to raise fish in reservoirs. A water surface area of 950,000 mu of reservoirs throughout the province is currently being used for the breeding of fish. The water surface utilization rate approaches 90 percent of the total water surface area, with the raising of fish in virtually every reservoir. Output of mature fish from reservoirs was 7.88 million jin in 1978; 8.86 million jin in 1979, and 10.64 million jin last year, for an average of more than 11 jin per mu, the national average. Last year gross income from the raising of fish was 8.23 million yuan, and per capita income of those employed in the fishing industry averaged more than 1,000 yuan. In 12 of the county's prefectures, the raising of fish in reservoirs showed increases in output. In the large Sancha Reservoir, the annual catch was more than 280,000 jin. The medium size Wumutan Reservoir in Dazhu County has had consistently high yields for several consecutive years, the highest being 56 jin per mu. The Small Xingfu Reservoir in Hu County had yields of more than 300 jin per mu. These are advanced typical examples of high yields of mature fish and the quite good development of the fishing industry.

Sichuan Province has more than 12,000 large, medium, and small reservoirs, with a broad water surface that has not been well used in the past. During the past several years, acting in the spirit of relevant documents from superior authority, all echelons of water conservancy management departments have made diversification and multiple utilization, particularly the development of fish raising, a major task of reservoir management units. They have made fish and water part of a single whole, instituting unified leadership in the management of reservoir irrigation and reservoir raising of fish, helping reservoirs formulate plans for the development of fish raising, and providing them with a certain amount of support funds. They have also encouraged reservoirs to accumulate funds themselves, to build and expand fish breeding ponds, to increase equipment to prevent the escape of fish, and to acquire nets and gear to catch fish, boats, etc. Throughout the province more than 9000 mu of fish breeding ponds have been constructed to achieve self-sufficiency in fish breeding. Some places still bring in tropical, temperate, and frigid water fish from Xinjiang, Hubei, Shanxi, and Beijing. They operate training classes in techniques in raising fish in reservoirs, and they select personnel to go to other provinces to study advanced experiences. Units concerned at all echelons have also launched cooperative research on materials needed, supply of feed, and funds to support fisheries, giving much help to reservoirs in raising fish. In the raising of fish, most reservoir management units have instituted systems of responsibility of fixed auotas, contracting, and rewards for overfulfillment of quotas. All these things have played an extremely great role in giving impetus to the development of fish raising in reservoirs.

Not only has development of fish raising in reservoirs made the most of water conservancy project benefits to provide fresh fish to markets, but it has also increased income for reservoir management units, thereby reducing the burden on the state and improving management conditions and the lives of reservoir employees. Reservoirs now are self-sufficient or have a surplus for a large part of their management expenses.

Right now all the reservoir management units are giving close attention to the spring fish breeding season, vigorously breeding fry, and increasing the number of fish reproduced for which quotas are large in order to increase per unit yields, to strive to produce 13 million jin of mature fish this year from the province's reservoirs, and to have the income of those employed in fish raising average 1,200 yuan per capita.

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BRIEFS

RAPESEED PROCUREMENT--By June 20, over 1.02 billion jin of rapeseeds were procured by the State and delivered to granaries. This amount was greater than that delivered to granaries during the entire year of 1980, which was itself a bumper year for rapeseed production. Further procurement is still in progress. [Chengdu SICHUAN RIBAO in Chinese 27 Jun 81 p 1]

IMPROVED MANAGEMENT OF WATER CONSERVANCY--Last year, medium and small water conservancy project management units in 35 places in the province actively reformed their former management systems in which no concern was given economic benefits, operations were conducted without regard to costs, and earnings were not linked to the welfare of individual units and their employees. Preliminary results are already visible from management in accordance with requirements of the enterprises. All have safely gone through the higher water season, and the irrigated area of 1,066,100 mu was 95.7 percent of plan (16 places in the irrigated area having grain yields of more than 1000 jin per mu). Integrated operations, in which the raising of fish is paramount, also saw considerable development with revenues amounting to 2,674,900 yuan, or 96.8 percent of plan for a 30 percent increase over 1979. Management personnel had incomes averaging 1,660 yuan per capita, 400 yuan higher than the average per capita income in 1979 for the 563 water conservancy project management units managed by the state throughout the province. [Excerpt] [Chengdu SICHUAN RIBAO in Chinese 26 Apr 81 p 3] 9432

CSO: 4007/454

BRIEFS

COTTON CULTIVATION--Zhejiang Province has strengthened field management for the 1.29 million mu sown to cotton this year. More than 24,900 production teams have implemented the production responsibility system in cotton production. [OW101525 Hangzhou Zhejiang Provincial Service in Mandarin 1040 GMT 4 Jul 81]

MUNICIPALITY DAIRY INDUSTRY--Jinghua Municipality in Zhejiang supports collectives and communes in raising milch-cows. Now there are over 1,500 milch-cows bred by both collectives and individual commune member households. [Hangzhou Zhejiang Provincial Service in Mandarin 1040 GMT 11 Jul 81]

CSO: 4020/225

Agricultural Research

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ORG: Pinghe County Institute of Biology, Fujian Province

TITLE: "Effects of Applying Nitrogen Fixing Bacterial Agent on Leaf Surface of Rice"

SOURCE: Beijing NONGYE KEJI TONGXUN [AGRICULTURAL SCIENCE AND TECHNOLOGY NEWSLETTER] in Chinese No 6, 17 Jun 81 p 2

ABSTRACT: After the report of the discovery of the Dutch scientist Ruine concerning the nitrogen fixing ability of leaves of tropical plants, biologists of the world have given a great deal of attention to the investigation and application of leaf-surface nitrogen fixing bacteria and regarded the discovery to be the start of a new and promising pathway of using biotic nitrogen fixation for yield increase of crops. The subtropical climate of South China is very favorable for the development of biotic nitrogen fertilizer. The Pinghe County Institute of Biology; therefore, proceeded with field experiments using the 2 bacterial strains of 1402 and 1403 supplied by the Research Institute of Botany, Chinese Academy of Sciences, and signs of yield increase effect was preliminarily obtained. For the purpose of meeting the needs of the gene types of local rice breeds, experiments were continued with leaf-surface bacteria of local breeds. To date, yield increases of 6-10 percent have been demonstrated by spraying the bacterial agent obtained. Preparation procedure of the bacterial agent and effects of its application are reported.

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TITLE: "Correlation Principle of Corn Organ Formation Used to Guide Field Production"

SOURCE: Beijing NONGYE KEJI TONGXUN [AGRICULTURAL SCIENCE AND TECHNOLOGY NEWSLETTER] in Chinese No 6, 17 Jun 81 pp 8-9

ABSTRACT: The extension of corn leaves is in layers to provide an ideal morphological indication for observing the growth and development process of corn. In a research in 1979-80, the authors clarified a correlation principle of the growth process of leaves and the formation of other organs (roots, stem, leaf, female spike, etc.) of major breeds of spring, intercropped, and summer corn in Beijing region, to produce morphological methods of determining the leaf-age of corn. Using the leaf age of corn as the indicator, proper farming measures may be timely adopted to promote or control the growth and development of each organ of corn with predictable results so as to obtain high and stable yield. The correlation principle of leaf growth and organ formation of corn, using leaf age of corn as the indicator for field management, and 3 methods of identifying the leaf age of corn are explained.

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TITLE: "Using Corn Leaves to Bait Cotton Bollworms"

SOURCE: Beijing NONGYE KEJI TONGXUN [AGRICULTURAL SCIENCE AND TECHNOLOGY NEWSLETTER] in Chinese No 6, 17 Jun 81 p 29

ABSTRACT: Bollworms are the major cotton pest of the commune. In the past, willow branches were used to attract and capture them, with relatively good results. There has been a shortage of willow branches, however. Since 1976, the author and colleagues have organized the masses to use bundles of various types of grass and stubble for a bollworm bait experiment and bundles of corn leaves were discovered to produce very good results. Sun-dried corn leaves are found to be good if 10 or more leaves are bundled together by being tied in the middle to form a bundle .8-1 chi in lengh . About 30 bundles/mu of corn leaves will produce the same effect as 20 bundles of willow branch bundles for attracting bollworms. If red spiders are found on the corn leaves, a 1:2,000 trichloro miticide should be used to soak the leaves first. The soaking will not greatly affect the bollworm attracting effect of the corn leaves. After each wind or rain storm, the field should be inspected to adjust the leaf-bundles, which should be changed every 7 days or when they become moldy from the rain.

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Climatology

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TITLE: "Investigation into the Problem of Cold Damage to Single Crop Intermediate Rice in Yunnan Province"

SOURCE: Kunming YUNNAN NONGYE KEJI [YUNNAN AGRICULTURAL SCIENCE AND TECHNOLOGY] in Chinese No 3, 25 May 81 pp 16-19

ABSTRACT: Three single-season rice regions of the world, frequently threatened by cold weather, Yunnan and the Northeast of China and Japan, represented respectively by Kunming, Huaide, and Zhahuang [transliteration of Japanese place name] are selected for discussion of the problem. During the rice growing period, the temperature characteristics of Yunnan are generally the opposite of those of the others, however. Judging from the severe damages of 1965, 71, and 74, they were all caused by the lower than 17°C temperature of late Aug (continuous for more than 4 days,) to result in an obstruction type of damage suffered just before or after blooming and fertilization. Unlike the conditions of Japan and the Northeast, in Yunnan there is very little possibility of delayed growth type of cold damage. It appears that in Yunnan, improper introduction or selection of rice breeds of late heading characteristic contributes mostly to the incidences of cold damage.

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TITLE: "Survey Report of Summer-Autumn Planted Wheat"

SOURCE: Kunming YUNNAN NONGYE KEJI [YUNNAN AGRICULTURAL SCIENCE AND TECHNOLOGY] in Chinese No 3, 25 May 81 pp 40-43, 34

ABSTRACT: For the purpose of fully utilizing the natural advantages of the province and avoiding the disadvantageous conditions, a survey group was organized to investigate the condition of summer-autumn planted wheat, in 1980, during the period from heading to ripening, i.e. from the middle of Oct to early Nov, in the various counties all over the province where it has been extended. Summer-autumn planted wheat is a new fruit of scientific research, with the objective of full utilization of the rain, the heat energy, and the daylight of summer and autumn to increase the unit yield of upland fields. According to incomplete statistics, it was extended to above 42,000 mu in 28 counties. Natural conditions and the wheat crops of 1980 are described after dividing these counties into 3 regions. The paper concludes that (1) In the region of 24°-26°N, future efforts should be improving the unit yield to promote even larger acreage; (2) In the region to the north of 26°N, more demonstration of the technique is suggested; (3) In the region to the south of 24°N, with about 150mm of rain from Nov to Apr, experimentation, demonstration, and extension of autumn planted wheat to gradually replace winter wheat is urged so that unit yield of wheat for the year and the land utilization rate may be raised.

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